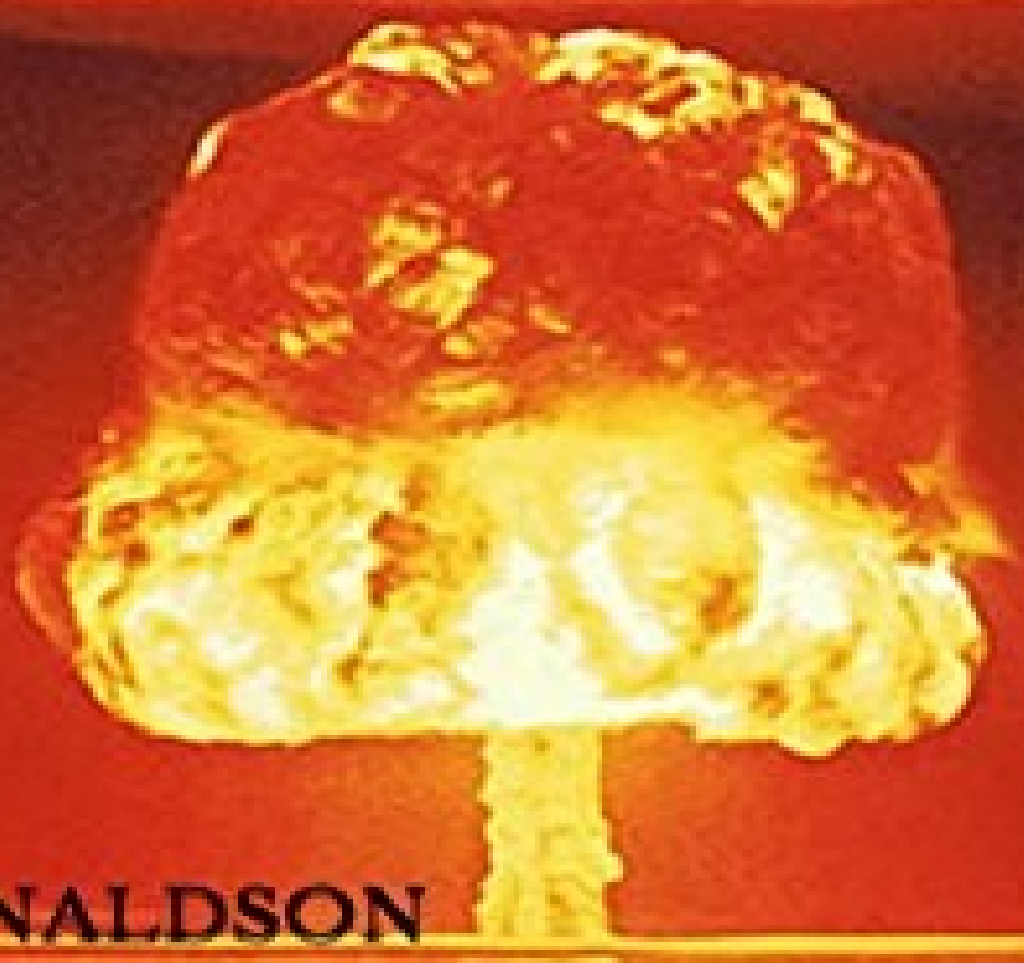


Basic Survival and Communications Skills in the Aftermath



RICK DONALDSON

Basic Survival and Communications Skills in the Aftermath

By

Rick Donaldson

Basic Survival and Communications Skills in the Aftermath by Rick Donaldson

Copyright © 2014 by Rick Donaldson. All rights reserved.

No part of this book may be reproduced in any written, electronic, recording, or photocopying without written permission of the publisher or author. The exception would be in the case of brief quotations embodied in the critical articles or reviews and pages where permission is specifically granted by the publisher or author.

Although every precaution has been taken to verify the accuracy of the information contained herein, the author and publisher assume no responsibility for any errors or omissions. No liability is assumed for damages that may result from the use or misuse of information contained within.

Table of Contents

Basic Survival and Communications Skills in the Aftermath	1
Basic Survival and Communications Skills in the Aftermath by Rick Donaldson	2
Dedication	7
About the Author	8
Preface	9
About this book	12
How to Use this Manual	15
Audience	16
Legal Stuff	17
Emergency Communications	21
Aftermath Communications	22
What is the Aftermath?	22
TEOTWAWKI	27
The End of the World As We Know It	27
What is Electromagnetic Pulse?	34
Transmitters, receivers, transceivers	37
What they are; how they are used; how to protect them	37
Radio Systems, types, uses	45
What is a radio system?	45
Antenna Basics	50
A Glossary for the Radio Communications Uninitiated	50
What is an Antenna?	51
When to use survival communications	55
Survival	55
Situational Awareness	56
When NOT to use survival communications	64
O Why you shouldn't use radio communications sometimes.	64
Triangulation	64
Being found inadvertently	66
Don't be a "Gold mine"	67
COMSEC – Communications Security	68
OPSEC – Operation Security	69
Table-Topping, War Gaming, and Thought Experiments	71
Amateur Radio vs. CB Radio vs. Other radios	73
Amateur Radio	73
A little about Citizen's Band (CB) Radio	76
Citizens Band (CB)	78

<u>Marine Radio</u>	<u>80</u>
<u>Family Radio Service and General Mobile Radio Service</u>	<u>81</u>
<u>Shortwave Listening (SWL)</u>	<u>83</u>
<u>What is HF and Shortwave?</u>	<u>83</u>
<u>A Radio Primer</u>	<u>85</u>
<u>Basic Crystal Radio Receiver</u>	<u>85</u>
<u>The Radio</u>	<u>86</u>
<u>The Simple "Crystal" Radio</u>	<u>87</u>
<u>The Theory of the Crystal Radio</u>	<u>91</u>
<u>When you don't have a diode</u>	<u>93</u>
<u>Electrical Power in the Aftermath</u>	<u>95</u>
<u>How do I get electricity when it's not being produced commercially?</u>	<u>95</u>
<u>Solar Panels</u>	<u>95</u>
<u>Lead-Acid Cells</u>	<u>95</u>
<u>Generators</u>	<u>95</u>
<u>Inverters</u>	<u>95</u>
<u>Non-Radio Communications</u>	<u>96</u>
<u>Hand Signals</u>	<u>96</u>
<u>Using a Signal Mirror</u>	<u>98</u>
<u>Whistle</u>	<u>98</u>
<u>Ground Markings</u>	<u>98</u>
<u>Three Fires, Three Shots, Three Whistles</u>	<u>98</u>
<u>Frequently asked Questions for Communications:</u>	<u>99</u>
<u>Basic Survival Skills</u>	<u>108</u>
<u>What is survival?</u>	<u>108</u>
<u>Survival Skills</u>	<u>113</u>
<u>Basic Survival Skills List</u>	<u>114</u>
<u>Shelter</u>	<u>115</u>
<u>Creating a shelter (one night or long term)</u>	<u>115</u>
<u>Obtaining water (and purifying)</u>	<u>116</u>
<u>Starting a fire (and how to keep it going)</u>	<u>116</u>
<u>Maintaining your body temperature</u>	<u>116</u>
<u>Finding edible food sources</u>	<u>117</u>
<u>Self-defense</u>	<u>117</u>
<u>Nutrition</u>	<u>118</u>
<u>Knot tying</u>	<u>119</u>
<u>Tracking – Recognizing dangerous animals and food sources</u>	<u>119</u>
<u>Hunting and Fishing – by various means</u>	<u>119</u>

<u>Tracking</u>	<u>120</u>
<u>Forecasting Weather</u>	<u>121</u>
<u>Disposal of Waste and Sanitation</u>	<u>121</u>
<u>Basic First Aid skills – CPR/AED</u>	<u>121</u>
<u>Navigation (Land, water, and other terrain)</u>	<u>122</u>
<u>Hiding, escape and evasion</u>	<u>122</u>
<u>Miscellaneous</u>	<u>123</u>
<u>Combat Mindset: The Cooper Color Code</u>	<u>127</u>
<u>Colonel Cooper's States of Readiness</u>	<u>129</u>
<u>Field Expedient Weapons</u>	<u>130</u>
<u>Locating Water</u>	<u>130</u>
<u>Water Storage at Home</u>	<u>132</u>
<u>Nuclear War</u>	<u>136</u>
<u>A snapshot – September-October 2013</u>	<u>136</u>
<u>Fallout Shelters and Nuclear Information for the Survivor</u>	<u>139</u>
<u>Why do I need a shelter?</u>	<u>140</u>
<u>Nuclear Weapons</u>	<u>140</u>
<u>Fallout and Radiation Effects</u>	<u>140</u>
<u>Volcanic Activity</u>	<u>142</u>
<u>Incoming Asteroids, Social Break Down, World War IV</u>	<u>144</u>
<u>Fallout Shelters</u>	<u>144</u>
<u>More Informational Links</u>	<u>145</u>
<u>Final Notes</u>	<u>145</u>
<u>Circumstances Beyond Our Control</u>	<u>147</u>
<u>Notes about "Circumstances"</u>	<u>149</u>
<u>What about ME?</u>	<u>151</u>
<u>Final Thoughts:</u>	<u>153</u>

Dedication

For my wonderful wife, JoAnne a fighter and survivor, a person without whom the world wouldn't even revolve, let alone exist for me.

About the Author

Rick is a former military Non-Commissioned Officer serving twenty-six years in the United States Air Force in Combat Communications, White House Communications Agency and as the Communications Flight chief for the 302nd Tactical Airlift Wing. The last eighteen years he has served the Missile Defense Agency as a Security Engineer and Electronics Technician. He has been a communicator, military trainer, college teacher and contractor, and has worked with his family over the last 40 years to develop survival skills in the children and now the grand children, spouses and other family and friends. Rick has traveled extensively having visited approximately fifty countries, including islands in the South Pacific, Caribbean, and five continents. Rick's hobbies include Amateur Radio, Amateur Astronomy, building and shooting bows and arrows, sailing, hiking, sword fighting and writing. Rick does not consider himself to be "an expert" in all forms of survival but has a "Jack-of-All-Trades" mentality and knowledge in many fields. He believes that being an expert in only one field of experience is limiting, but having some knowledge in a lot of fields, however rudimentary that knowledge might be is better than knowing nothing at all.

Preface

The human race is here for only a short time, relatively speaking. It is said that modern humans have been around for approximately 200,000 years; Neanderthals lived as far back and 600,000 years ago and prior to that the earliest documented and known hominids were the Homo habilis who appear to have come into being around 2.3 million years ago. The latter bipedal creatures appear to be our ancestors and were tool making creatures. There are those who believe in evolution, those who believe in Creationism – but we're not here to debate for or against either of those theories. We're here to discuss the future of the human race, rather than the past. But to do so, we must have a grasp on history in particular, that of modern humans especially in the past century.

Over the course of known human history there have been disasters that have wiped out entire islands, or whole populations. Wars are certainly a factor in the survival of cultures and peoples. Our world today is rife with danger, war, disasters ranging from hurricanes to more localized emergencies such as tornadoes, flooding, volcanic eruption, earthquake and tsunami. Human memory is limited to that which is within our personal sphere of experiences and thus if we read of history, we have less of an appreciation for what those before us have gone through, as opposed to living through something that becomes history. Survivors of disasters tend to be better prepared in the future. Those who have observed tornadoes, hurricanes and earthquakes personally are more than ready to prepare for the next disaster than those who live out their lives ignoring the rest of the world.

One thing comes to the top of the ash heap of history though, and that is regardless of the type of disaster we encounter, the human race continues. Humans pick up the pieces and go on about their lives, insinuating themselves into every nook and cranny of the planet. As of this writing there are 7+ billion people on this planet and the population is growing. This is not a bad thing as some would suggest, and we are doing what any other species on this planet does, ensuring our survival. But, the predictions that there will be 13 billion people on planet Earth by the year 2100 is chilling.

The Human Race is on a train track headed for either overpopulation of the world or destruction of most, if not all of the human race because of the disparity of political thinking on a planetary scale. Hundreds of countries and millions of people who have, for the most part become throw-away societies can only end in either using up their resources, or killing one another for the resources of others. It appears to be a matter of time before something breaks... badly.

Daily we hear of wars, death and destruction sometimes on a scale none of us can imagine. Most go on with the idea that "It can't happen here, not to me". But people die untimely deaths and will continue to do so, in spite of "Government Regulations" aimed at 'helping' us. Personally, this author is convinced government regulations are merely a way to getting into our personal lives, whether by regulating what you can eat, drink, or stopping coal from being used in power plants (you know,

to protect the very air you breathe) to who should or shouldn't go to school, and who needs to give up something in sacrifice to those too lazy to work. Either way – the US government is more about “control” these days than it has been in the past.

Over the years, the author has been involved on a small scale, trying to help people to understand the politics around them, and how politics may relate to their very survival. Many pooh-pooh our discussions; occasionally they think us to be “war mongers”, or just plain “stupid” because we don't see the more “Liberal” ideas as being “safe, sane” and “the right way to do things, peacefully”. With that kind of an attitude it is no wonder that when the crap really starts flying, many people simply do the WRONG thing, and die. And they will continue to do the wrong, dumb thing. Uninformed people will always make bad mistakes when it comes to survival, because they have been taught incorrectly about what is right and wrong to do. Not to say they are stupid, just uninformed. Unfortunately, many people don't want to learn or already believe they know more than they truly know.

Survival communications has always been important to me because I've been in some dangerous places. Before there were cell phones, there were radios. Before radios, there were smoke signals. Before smoke signals there were runners, and other signals to warn neighbors, maybe shouts, or hitting rocks together. The Romans used signal fires along a front to warn distant guards of trouble. So the human race has always tried to do the same thing, to communicate in an effort to help their fellow man stay alive or direct an attack on other humans (or animals).

This paper encompasses the practical aspects of just what “survival communications” really is, but there is an underlying tone that has nothing to do with a day-in-day-out paradigm of how cops or fire fighters survive using communications. Instead we focus on the normal person, you, and when things really go very, very wrong. The idea for this paper has grown from the many questions I have received from others as a professional communicator, and as an Amateur Radio Operator. Since I have been involved with radios since childhood, all sorts of communications-related questions are directed to me, everything from radios to use, to how to communicate in an emergency. Sometimes outlandish questions come to me, which I can't answer in the context. Thus in this paper we try to give a scenarios that makes sense for our purposes.

Over the years I have installed and maintained a lot of different types of communications systems and worked on everything from tactical military equipment to commercial police and fire radio systems on the professional side of life. I've gone from “Technician” class in Amateur Radio to “Amateur Extra Class” licensee on the “Amateur” side. I've held a First Class Radiotelephone License (as well as 3rd and 2nd) and I've worked with the Amateur Radio Emergency Service (ARES), Radio Amateur Emergency Service (RACES), and many “served agencies” (like the Red Cross, FEMA when I was in the military, and police and fire Emergency Operations Centers).

I spent 26 years in the Air Force, traveled extensively, worked in Combat Communications which took me to many countries and in at least one of which I wound up in a couple of bad situations. Later I traveled with the White House

Communications Agency and put in communications for the President and Vice President of the United States. A lot of water has gone under the bridge since those days, but survival and communications has always remained in forefront of my life. The two things naturally go together. I'm hoping to show you through examples how this is so.

Throughout my entire radio and electronics career, through raising children and sometimes raising or caring for grandchildren, my wife and I have always kept the old Boy Scout motto at hand – Be Prepared. I've studied every survival manual I could find, as well as learned to hunt, fish, track and do basic things like simple wood working, mechanics, metal working and a dozen other small, lesser used "survival skills". I have always felt that food storage, water storage and keeping yourself ready for whatever "disaster" might occur were a number one priority, thus we've always kept ourselves prepared with food, water, weapons, ammo, communications equipment and so forth. I tried to pass as much knowledge to our children as possible. Now, we're about to retire and I think I should pass on what little knowledge I can to others in case the Big Balloon goes up – which given world circumstances as I write this might be any day of the week.

I believe we are in for some very rough times ahead. As I finalize this Preface, Russia and the US are squaring off in what might be called "The Second Cold War"[\[1\]](#). Threats and accusations are flying. Syria is a powder keg. But the Middle East hasn't changed in thousands of years and wars there are a constant reminder of the fragility of civilization. Iran is trying to obtain nuclear weapons (and perhaps already have them). Israel is trying to find a way to stop them. Our own government has fallen into "Socialism" and America is becoming less and less free every day as we, the normal population who has nothing to say about the regulations, sits by and watches it happen. The economies of Greece, Spain, Italy and even the United States are in shambles. Personally, I don't believe in "Mayan prophecies", or "Biblical prophecies" – but an awful lot of you do, and you might be right. But either way, the world didn't end in December 2012; of course, there's always a random asteroid, an exploding super volcano, nuclear war or some other disaster that could do us in! As I read this last draft today, Ebola has made it to the United States, ISIS is a "new" terrorist group calling themselves "Islamic State" and threatening (and perhaps even have the power) to attack the United States...

In the real world, one domino tipped over in the wrong place can trigger world war, economic collapse, famine, death and destruction. Are you ready for the worst? And if you're not, don't you think you ought to consider preparing now, if not for yourself, then for your family?

Rick Donaldson, October 2014

About this book

When I started putting this manual together I pulled a lot of information from my own notes and articles I've written over the years in the form of posts on various forums. Some were on survival forums and some were on radio forums, other information came from various email lists I posted since before the Internet existed as we know it today. Over the years I have answered thousands of questions for ham radio operators and those interested in radio; and I've asked twice that number of others. Teaching is learning. As a teacher, I learned more than my students. One of the reasons I put this together was to help people completely uninitiated in communications and Survivalism, but also for those who already have started putting together survival equipment and have put themselves into a "survival mentality" but aren't quite there yet.

This book was put together specifically for the Kindle and other e-readers. Especially e-ink type readers like the Kindle DX (because it has a larger screen). In fact part of my survival equipment contains just such a device. I've spent time converting PDF files, web pages, HTML and Word Document files into something that can be easily stored and read on the Kindle DX.

As such, this book is a little different from other books. It's technically not a print book, but could be and I've designed it to be used with a live Internet connection for clicking and using links. My recommendation is that once you have your copy you put it on your e-ink device, and store a copy on your thumb drive to be used later if you have access to a computer when the world takes a turn for the worse.

Obviously some information will become unavailable if the Internet goes down. Many computers and hard drives will no longer be useful after an EMP (more on EMP later) and printing hard copies of files is a good idea. Eventually I may make this book available as a hard copy but that won't be any time soon.

The one subject for certain that I can claim being an "expert" is radio, radio communications and the use of various radio systems. Obviously times change and so do methods, but basic radio hasn't changed much since its invention. The FCC rules and regulations in the United States (as well as rules and regulations in other countries) however do change from time to time as evidenced by the changes in Amateur Radio Licensing since the 1960s to present. Expect that those rules may change yet again in a few years and expect that I will update this manual as required (and possible).

Another important aspect to this book is that it is written for those who already know something about being a survivalist – but can be used by anyone at all, without any background. There will be several sections after the main body of the book that is concerned specifically with basic survival information. The book is not a be-all-to-win-all book. This author is not an expert on everything and has no intention of trying to prove he is. At the same time this manual is for those who already know something, it is also a basic manual for those who have just "awakened". Please be aware there are many good books on basic survival (and I won't try to cover some aspects here at

all), survival manuals written by and for military personnel are my favorites; they are simple, and written for people with limited time to process information and must remember it in extremely stressful conditions. The Air Force, Army, Navy, Marines, Special Ops and British SAS version of manuals are similar, complete and each and every one of them will make a very good addition to a library. In fact, I suggest getting one of each; and read them from time to time.

Over the past six years prior to this writing our country has gone, in my humble opinion, to hell in a hand basket. The Obama Administration has had scandal after scandal. The NSA is spying on the people of this country more than they spy on terrorists. The IRS has attempted to suppress the "Tea Party". A war on guns has ensued and thus far us gun owners are winning. The *Affordable Health Care Act* also known as "Obamacare" is being shoved down our throats by lazy Congressmen and women, bureaucrats in the IRS and the President himself. Americans are simply fed up. We are living in a tyranny and many people just don't care, but the majority of Americans have finally awakened.

Because we are Americans, we are independent, we are strong, and we oppose Tyranny. Unfortunately, tyranny has come home to roost in America and few are doing anything right now to stop it, except for some civil disobedience on individual levels. It will certainly get worse before it gets better. Mr. Obama's "fundamental change" for America has now been defined for us by the actions of this Administration. Our country is faltering and many of us foresee the final "doom" of the United States as it was when we grew up. We don't want it to come, but it is on track to destroy the America we all believed in as children. The fact is, most of us will fight what is coming and it will end up being violent unless the Administration and the Socialist/Marxist faction in this country cease what they are doing. They haven't realized yet that we oppose Marxism and we will oppose them to the death. They also haven't realized that we aren't going to give up our guns for this very reason.

But we all have one thing we must understand, if our economy fails to a certain point the Depression will appear to be the Golden Age of America. There will be a lack of food, supplies, and fuel to move those items. There will be brownouts, and blackouts of the power grid. Of course thousands before me have predicted the same thing when Y2K came, the turn of the century, when new asteroids were spotted and even over things like Yellowstone. Most of those things turned out to be nothing, and indeed this phase America is going through could turn out the same; nothing. But if it does happen, everyone will suffer—young and old, middle-aged, Left Wing, Right Wing, animals and people alike.

Though these predictions are put forth, fortunately they rarely come true. In fact, I sincerely hope I'm wrong. I want to see my grandchildren grow up and be prosperous, not living in tents in the mountains of Colorado, having become part of the hunting and gathering crowd of the new Dark Age.

Our country lives on energy. We will die with a lack of energy. But before we ever get to that point we can have outside forces like asteroids, Yellowstone's super volcano, a sneak nuclear attack by Russia or China or perhaps worse, an EMP take

us down. Like energy, technology (which runs on energy) is another foundation stone of America. Banks, Internet, cell phones, medicine, you name it, would have an effect on simple, daily life if it suddenly “wasn’t anymore”. An EMP would destroy a vast majority of electronics, computers, and communications bringing the Internet to its knees. Banks wouldn’t be able to function normally, and would have to go back to the old days of ledgers and pen and paper. Credit cards and debit cards wouldn’t work. You would have to get to the bank, take out your money, if they have any, and then use that. Because there is no power, it would be difficult to track money anyway. And truthfully, what would the dollar be worth then anyway? On the bright side, life would slow down....

Bartering would become a new way of life for many, at least for a few days before the gangs started hitting those who have something to take it away. Riots would start, looting would be rampant, murders, rape, robbery would go unstoppable, unpunished and cops, fire fighters and other public servants would disappear partially out of fear and partially out of wanting to help their own families.

Enclaves would in time develop out of fear and for mutual protection within cities and out to the suburbs. Others would flee and make their way to rural areas where they might run into farmers and “country folk” intent on protecting what they have at all costs. Some will run to the mountains, to cabins and to wilderness. Many of them will die quickly, not being prepared. The prepared will go on a little longer until the woods are overrun with city folks.

This is a very bleak outlook and perhaps there are some of you out there reading this thinking “It wouldn’t be so bad!” and maybe it wouldn’t be, being kicked back to the mid-19th Century for technology. But maybe it would, and probably millions would die of starvation, lack of water, lack of medical facilities and other complications.

An important psychological aspect of human beings is that we are social creatures. We like human contact. We love our families and want to remain connected to them. In this day and age it’s easy to pick up a phone, and almost everyone has a cellular phone, make a post on Facebook, Twitter or post a message on a blog or send an email to anyone on the planet. If all that suddenly went away, how would you remain in contact with your family? How would you remain in contact with humanity if half of us died and we were suddenly isolated in a dangerous area of the country?

This manual is here to start you off thinking on how to stay in touch with your family, with civilization and to remain “human”.

How to Use this Manual

Simply read the manual. Keep in mind there are links throughout the book and every effort has been made to ensure that at the time of publication all links are functional. However, links and web sites come and go on the Internet. There will be links that will eventually cease functioning (and given the subject of this book, the whole Internet could eventually be obliterated—though that fate is yet to come to fruition.)

If for some reason a link does not function, there are always search engines and the most important computer you have ever used, your own brain. Remember that you can do research yourself using proper keywords in various search engines given the topic material you're reading. Thus, if a link has died, or isn't working, you can also do searches for similar web sites. Those included in this manual are merely the best choices I've found. There are certainly other sites containing the information you need, though it might be more spread out and you'll have to dig a bit deeper. Oh, and don't forget the original storage database, the local Library!

This manual is here to pull as much information together in one place, so that you don't have to spend as much time researching things yourself. However, never forget that the final outcome of any situation you find yourself in ultimately depends on your own common sense and quick thinking. A manual is never meant to replace personal knowledge; only to assist you in gaining, and even putting into practice that knowledge.

This manual does NOT contain a lot of images. In fact, it has only a few specifically for antennas and radio material because there isn't enough space for pictures. The text should be clear enough in most cases. If not, again, a good search engine with the proper key words and phrase should bring up a plethora of images related to the subject. While you might consider that a cop-out, remember that this author is not an artist. I am not a photographer. I can't draw, but others do and copyright laws are there to protect others from having their material heisted and used by others without permission. The space required to make this manual isn't large enough to place images that won't really add to the information.

Don't be deterred however, the information is good. Everyone needs to exercise their brains as much as their bodies to remain health!

Audience

This manual is mostly for Americans, Canadians and people in the United Kingdom. However, the information can be used in other countries but obviously laws differ on radio systems in other countries. While the author has traveled extensively all over the world, he has not concentrated on making a generic publication for “everyone” because there are too many variables involved.

The manual is for anyone mature enough to grasp the concepts.

Legal Stuff

First and foremost, here's a disclaimer here for everyone to read and heed and it will be repeated throughout this manual.

The author takes no responsibility for anything should you do something illegal; that is, if you do something illegal, you're going to get caught eventually. If I tell you something then it is legal at the time this was written, if you're licensed to do it and if you follow all of the associated regulations. Anything that is in the "Aftermath" will probably not be "enforced" because frankly there won't be any enforcers. If it is normal, everyday life, then the world hasn't ended, and therefore civilization is still going, then you would please follow the laws in place.

Arguments we have heard about the government plotting and planning to know who the hams are, the gun owners are and so forth are ridiculous. If you break the law you can be fined, lose equipment, go to jail or worse. Fines for interfering with a radio service, for instance can go as high as \$10,000 dollars per offense. So if you are found guilty of transmitting, say over a police frequency 10 times in one hour, you can add a \$100,000 fine to your punishment, which might include jail time as well. If someone dies because of your interference, count in other charges you don't want to think about.

Before you go any further, I strongly recommend anyone planning on transmitting on any frequency in the United States learn what they are doing first. Know the laws. Get a license if it is required for the radio service you plan to use. If society hasn't broken down, there is an "authority" in charge (read: Government) then there's no excuse for breaking a law. If there's no government, chaos reigns, or you're doing day-to-day survival, then all bets are off. And that's the test; If this is an emergency, almost all bets are off (Note you could still be charged with interfering on certain frequencies even in an emergency under even normal conditions).

If you live outside the USA then you and you alone are responsible for finding out your own local and regional laws. I don't know them, and can't and won't advise on such things. I am not a lawyer (and never wanted to be!) nor should you take any advice I give without ensuring you're being legal. I invite you to check the sources provided throughout the paper, as well as your own sources to verify any information I provide. Please, also remember that each state might have different regulations and what's perfectly legal on one place is completely against the law of another state. With the noted exception of the "scenarios" provided, everything else is based on personal knowledge, information anyone can read in open source documents, news articles and books.

(NOTE: A quick example on state laws for you, radar detectors and recording phone calls: In Colorado where I live it is legal to tap your own phone or secretly record others – as long as one of the parties being recorded knows; you for instance. In some states on the East Coast, it is illegal to have a radar detector in your car. In some states it is legal to carry a portable scanner with

you and monitor police frequencies. In other states, it's against the law to carry that same scanner.)

If you want to use Amateur Radio then get your HAM license. This makes it legal to transmit on literally thousands of frequencies in many modes from Morse code to FM, AM, SSB etc. I currently hold a United States, Amateur Extra Class license (Call sign N0NJY) granted me by the Federal Communications Commission. Therefore anything I tell you here must be “legal”. I will tell you the legal and illegal aspects of such a thing if I CAN. I WILL cover being a ham radio operator in one of the chapters. Ham radio operators can work on and modify equipment in their own frequency bands. For things outside the Amateur bands, see the next part below.

Get a General Radio Telephone Operators license if you want to work on television, radio stations and the like. This license lets you work on, operate and maintain radio equipment, specifically commercial equipment.

<http://wireless.fcc.gov/commoperators/index.htm?job=pg>

Most people won't need, or want to bother with study for such a license. We are merely pointing out there are legal requirements in the US for working on, using and operating radio equipment. By the way, the General Radio Telephone Operators license is the one issued now; the one I held in the 80s was the “First Class Radio telephone license”.

Ships - Ship to shore.

Who needs a station license?

You do not need a license to operate a marine VHF radio, radar, or emergency position-indicating radio beacons (EPIRB) aboard voluntary ships operating domestically. The terms "voluntary" and "domestic" are defined below. Although a license is no longer required for these ships, you may still obtain a license (and call sign) by following the procedures outlined in Section IV.

(From the FCC site at <http://wireless.fcc.gov/marine/fctsht14.html>)

If you're going to operate an HF radio in "marine frequencies" you will need to have a ship's license. That means you need to have a boat which is normally in the water to operate legally. In the "Aftermath" no one is going to care and that goes for all the other systems. If there is a license required, no one is going to care in the "Aftermath". Do what you will, but don't blame me if it's not the "Aftermath". Hope that's clear now...

What radio equipment may I operate aboard a vessel (as an example)?

You do not need a license to use marine VHF radios, any type of EPIRB (an emergency transponder), any type of radar, GPS or LORAN receivers, depth finders, CB radio, or amateur radio (an amateur license is required) in the United States. Ships that use MF/HF single side-band radio, satellite communications, or telegraphy must continue to be licensed by the FCC. On April 17, 1996, the U.S. Coast Guard suspended enforcement activities concerning FCC Radio Station Licenses carried aboard voluntary ships. *(Note: Certain ships are required, over certain gross tonnage, while pleasure vessels like sailboats and yachts aren't "required" and are considered 'voluntary'.)*

Let me reiterate, if a license for the particular radio service you wish to use is required by US/Federal regulations, then get the license! Pay the money, take the tests if required and do it legally. Understand the regulations. The United States and other countries fall under something called the (<http://www.itu.int/home/>) International telecommunications Union. They (and the United States, as signatories for the treaty) set up international standards by which all countries operate on the Radio Frequency Spectrum.

As signers of this treaty we (the United States) are responsible to help maintain certain protocols in the use of the limited RF spectrum. This is why it is illegal for "Pirate broadcasters" to pick and choose HF, medium wave (AM band), FM frequencies or anything at random anywhere in the spectrum. This can cause (and usually does cause) interference to some other legitimate station. There are those who believe that because the RF spectrum is a "natural resource" and "free" they can use it however they wish. While it is true that it is a renewable natural resource, it is also true that the same frequencies can't be used at the same time, in the same area. What is not true is that you're free to use whatever channels and frequencies you

want when you want, because of the bedlam and chaos that would be caused by anyone transmitting anywhere they wanted, without regard to the regulations keeping things straight.

This does not mean that some countries and their military or governments (as in the case of China, North Korea, Russia, Cuba and other such places where Communism is rampant) will not jam other stations in other countries. The United States has even been known to jam other shortwave (SWL) stations. We use jamming on military frequencies where applicable. So does everyone else. **You** should not be jamming anyone, so follow the rules and no interference will be generated by you! **(Again, I point out if this is “The Aftermath” then whatever happens, happens.)**

Some examples of legal transmissions in the US are commercial stations, whether they are Short Wave Listening (SWL), AM stations, FM stations or commercial stations like trucking systems, railroads, or public systems like police, fire, ambulance and other emergency stations, Amateur radio (Ham radio), Citizens Band (CB) and personal radio communications like Family Radio Service (FRS) and General Mobile Radio Service (GMRS).

Right now, if you're interested in using radio systems at all, it is recommend you look into General Mobile Radio Service (GMRS), Family Radio Service (FRS) and Amateur radio right off the bat. Most of you are probably familiar with CB radio to some extent, but we'll cover a bit of history on that as well later. GMRS and FRS radios (more about this later but some links are provided below) are easily purchased. The former requires a license (5 year, renewable) and the latter is free to use, but is limited in power and antenna size, etc.

The very first thing you need to consider is, "Do I need or want some kind of personal communications? I have a cellular phone, a home phone, a work phone and hell, I've got the internet! What more do I need?"

Good question. Glad you asked. We will cover that soon.

Emergency Communications

Something everyone should know, if you have a bonafide emergency which is defined as “a situation that poses an immediate risk to health, life, property or environment”, where “environment” includes nuclear waste, forest fire or volcano, then you have the right, duty and responsibility to notify authorities or anyone else the emergency might affect immediately using any method available to you. Basically this means any form of radio communications whether you are licensed to use it or not.

As an example, let's say you are present just outside a bank when a robbery occurs. The responding officer is shot, perhaps killed and the bank robber has run off and jumped in a vehicle and fled. You have the duty as a citizen to respond to help the office (not to chase the bank robber). You could grab his radio microphone and make an emergency call to his dispatcher. Simply saying you are a citizen assisting a “police officer down” should be sufficient to get you immediate assistance, making sure to request ambulance and back up at your location.

Another example would be, as a crew member of a vessel in a waterway, if an emergency takes place and the Captain is incapacitated, you would make the required Mayday (or other) emergency call to receive assistance. You would also do so under the Captain's orders. If you're the only one aboard after an accident, you're it. You had better save yourself however you can.

So – if you ever find yourself in a position of being a “first, but untrained responder” your job is to get and direct help to the injured, dying people, burning buildings or whatever the case might be ***while remaining safe yourself if at all possible.***

If the world is falling apart around you, the cell phones will be jammed or not working at all then your first action is not to get the word out, your first action is to get yourself safe. Sometimes running from the terrorist attack is the right thing to do, no matter who has fallen behind you. If you die you can't help anyone. Your personal safety in all situations is paramount, unless you're trying to save someone's life. Then you are making decisions based on what you know and what you believe you can do in that given situation. We can only wish you luck in those cases. You might second guess yourself later, and others might second guess you, but what is going on right then and there, in your face is your problem, not theirs. Our personal safety is OUR PERSONAL RESPONSIBILITY! Never forget that. Not the police, not the government, not anyone around you are responsible for your safety.

There is your out for everything you have to do in an emergency. You are personally liable for your own health and welfare, safety and security. No one else on the planet can do it for you; except your mommy and daddy if you're 3 years old. It is time to grow up folks. Anyone reading this is likely not three years old.

Aftermath Communications

What is the Aftermath?

All around you things happen every day that might be an emergency. A car accident involving a motorcycle, a building fire, a water main break, construction accident with injuries, a bank robbery, car chase that goes horribly wrong for everyone, or a terrorist attack at the local mall or college campus. These incidents are emergencies, not “The Aftermath”. You might think they are, but they are not. These are every-day occurrences that can happen anywhere, anytime, some less-so than others. We would hope terrorist attacks are not yet the norm, but in some countries, they are indeed every-day happenings.

In the United States, we’re more likely to have car accidents, tornadoes, forest fires, occasional earthquakes or even a tsunami on a coast somewhere. All of these incidents are localized, one-time events that affect a few people at the time. Even the 9-11 attacks on the Pentagon and World Trade Center were not “Civilization Ending Events”. This paper is about those events that affect the entire United States. We won’t delve into what happens in other countries or even localized or regional events though the same events might be affecting others as well.

The events we will concentrate on are what we will call “Civilization Shattering”. A complete and total global economic meltdown, global thermonuclear war, a USA-wide Electromagnetic Pulse event (EMP)^[2], rogue asteroid strike, Yellowstone (or some other super volcano) explosion, a pandemic on the order of “Captain Trips” (from the Stephen King novel, “The Stand”)^[3] or perhaps even the unlikely Extraterrestrial Invasion by a hostile entity from parts unknown. Thus the “Aftermath” is obviously what is going on after the Civilization Shattering event.

Certainly some of you who’ve read this far have said to yourselves, “Ok, very farfetched – but possible” and others have thought “Oh, my God, another survivalist kook who thinks the world is going to end.” Well, I would say that the very idea of a civilization shattering incident is not farfetched, nor do I personally believe “The world is going to end”. But I know enough to know that pretty much anything is possible, especially when we least expect it or say “It can’t happen here!” The world might not “end” (because it will go on for billions of years) but Civilizations can, and have failed and rather rapidly at that.

How many people thought that the attack on the World Trade Center and Pentagon could actually happen? Not many. A few of us postulated such a thing and were told “Those terrorists only want money, they never hurt people. They usually let them go. Or they just shoot someone. They won’t CRASH a plane with themselves in it, though they might blow one up!” But we all know what happened, the thing no one believed would occur. Terrorists boarded airliners, hijacked the aircraft and flew them into buildings as missiles, without any making demands. Those terrorists did the unthinkable. But, why was it unthinkable? Because a few people just couldn’t conceive of that sort of evil? Exactly right. Those of us who did think of it were

labeled “kooks”. But, a lesson comes from this. Think like a bad guy to know how a bad guy thinks!

This incident was a regional disaster. It affected New York City, the Pentagon and nearly 3000 people were killed that day[4]. It might have been worse save for some quick thinking people aboard Flight 93[5] who fought the terrorists and though those heroes lost their lives they prevented that plane from flying into yet another building somewhere. Even though this affected us all in this country personally in some way, our country didn’t collapse, the world didn’t end. There wasn’t worldwide starvation, nuclear attacks and millions of people didn’t die. This incident was not an “Aftermath” scenario.

Over time NASA and scientists (both professional and amateur astronomers) have discovered thousands upon thousands of rocks in space called asteroids. There are categories labeled “Near Earth Asteroids” (NEO)[6] and “Potentially Hazardous Asteroids” (PHA)[7]. NEOs buzz the Earth from time to time, with generally a zero chance of ever hitting us under normal circumstances.

PHAs however are called “Potentially Hazardous” for a reason. They might under certain conditions be enticed out of their normal orbits (by gravity of other planets or asteroids) and cross the path of Earth close enough to strike the planet, or alternatively have their orbits compromised ever so slightly so that in the next time around they DO hit us.

Many are small and somewhat insignificant. But there are those large enough to cause what is termed a “Mass Extinction Event”[8]. The dinosaurs are believed to have been killed by the K-T event[9] (Cretaceous-Tertiary Mass Extinction event) wherein 70% of all species then alive on the planet died and over the next few eons became the fossils we see today in Natural History museums. The evidence of this event is not definitive and we’re still not 100% sure that only the asteroid strike killed the dinosaurs. In recent months we have read that some scientists believe there was a “One-Two” punch and that a massive super volcano exploded a short time (within a few hundred years perhaps, or perhaps even sooner possibly related directly to the K-T event) which caused the final extinction of the dinosaurs, along with other creatures from the planet.[10]

“Can’t happen now, today!” you say, right? Not so fast, this absolutely could happen today and this is one of the biggest threats the human race faces when it comes to extinction scenarios.[11] [12] While scientists have certainly discovered and charted thousands of rocks out there, they didn’t find them all. Space is a mighty big, very hostile and mostly unknown place to us mere specks of dust on planet Earth. There is no law, no rule; no science to date that can guarantee we will all live to see our Golden Years. Tomorrow might be the very day we all die due to a random set of events that leads to a massive asteroid hitting the Earth.

This IS an “Aftermath” scenario. Will communications matter then? We will see later.

Let's consider something near and dear to our hearts, in our own country somewhere north of Colorado and West of two thirds of the nation, Yellowstone National Park. This actively volcanic park is a beautiful place to visit. There are hot springs, rivers, woods and wild life and it's all protected from us "humans". We are prevented by regulations from killing and eating the animals (massively big elk, grizzly bears, moose and wolves, among other creatures living there). But lying beneath that wild beauty is a Balrog[\[13\]](#), a demon of destruction.

Yellowstone has had three major eruptions in the past.[\[14\]](#) There have been dozens (about 100) eruptions that have been none "explosive". The most recent, non-explosive type of eruption occurred about 70,000 years ago. But, we're not worried about small-scale stuff here. We're concerned with Earth-Shattering ramifications, the sort of thing you see in movies, and stamp your feet like Gandalf[\[15\]](#) saying, "That's not going to happen here!"

Unfortunately both Gandalf and you are wrong. Gandalf managed to stop the Balrog from getting to his friends, but he didn't stop it from getting him. You can't simply suggest that an event (natural or otherwise) won't happen and then it won't happen. You won't be able to stop it from getting your friends. When it happens, and it will, thousands if not millions will die and not just in the US. Ash clouds will affect heating from the sun, possibly pushing the planet into an ice age. At the very least weather patterns will change and cold will come, killing crops, animals and even people who were dependent upon those crops and animals as food sources.

640,000 years ago a caldera forming eruption took place in Yellowstone. 800,000 years before that event, and one more at 1.2 million years ago happened as well. During those eruptions, ash covered the western half of the United States to a depth of about from one-third of a meter (about a foot) to about a meter (about three feet) in depth several hundred miles from the explosion ground-zero.[\[16\]](#) Ash covered everything to the east of the explosion to several inches as the distance increased. Sulfur gases – aerosolized poisons, were carried around the globe on the winds. Scientists have determined that the real cause of "Global Cooling" was from this explosion and the temperatures worldwide noticeably were reduced. There is no evidence that people lived anywhere near there and scientists estimate modern humans have been around for about 200,000 years.[\[17\]](#) So, likely there were no people to experience this last explosion. Thank goodness for them, huh?

For the past few years of the 20th century Yellowstone has been undergoing changes. Early in the 21st century the ground water at certain areas has been pushed up and away, the ground has risen several inches, some underground rumblings have caught the attention of scientists, and hundreds of small quakes likely generated by volcanic activity deep below ground have been recorded. Researchers report the super-volcano underneath the state of Wyoming has been rising at a record rate since 2004. Its floor has gone up three inches per year for the last three years indicating the fastest rate since records began in 1923.[\[18\]](#)

On January 1st, 2009 a geologist[\[19\]](#) advised the possibility of a state of emergency for Yellowstone and advised people to leave the area within 200 miles

radius of Yellowstone. Few people listened, and others have stated “Not going to happen!” and so far it has not. What if it does, then what?

We can “What if” various scenarios to death – or perhaps until you die. But a “What If” is important in all scenarios you study. If Yellowstone decides that next Thursday is the day it’s going to blow up then nothing you, I or anyone else can do is going to affect the outcome of such a destructive natural disaster. You might survive and then what do you do? How do you find others? How do you communicate with them? Why would you want to? The majority of survivors will not simply lie down and die. Human beings simply aren’t wired that way.

Let’s take the least likely, most highly improbable event we can imagine; an alien technology significantly advanced beyond our own, or even our comprehension comes for a less-than-friendly visit. Is this even possible?[\[20\]](#) [\[21\]](#) Given the fact that there have been almost 1000 exoplanets discovered[\[22\]](#) and the fact that we now realize planets are found around a lot of stars gives good old Dr. Drake’s equation a bit better numbers to plug in. For the record Dr. Frank Drake[\[23\]](#) is an astrophysicist who came up with a famous equation called “Drake’s Equation”[\[24\]](#) to solve the possible number of Extraterrestrial civilizations that are possible. The equation[\[25\]](#) requires you enter some data, and some of that data is unknown to us. We can make our best guess and plug in random numbers and come up with all sorts of things.

But to the point, we can now better estimate the possibility of planets around stars, and further how many might just be “life sustaining”. Again, we’re talking astronomical distances, extreme technological capability and most important, do the aliens even want to bother with us or our planet? Some say “No way” others say “maybe”. We say “It’s possible, but unlikely.” Except that tiny, insignificant, nearly indistinct possibility is still there. Just because you disbelieve something doesn’t mean it isn’t true or won’t come to pass.

Why Aliens come to visit isn’t relevant if they are malevolent but the fact that we are way over-matched by their technology is important.[\[26\]](#) In fact this author believes we might have been visited in the remote past, not because someone convinced us – but rather aliens would likely visit us with robots or something insignificant we humans would never have noticed, such as nanorobots[\[27\]](#) (aka nanites if you’re a Trekker). If they come here with a highly advanced technology, and want what we have, we will become extinct shortly after their initial visit if they want to make that happen. On the other hand, they might ravage the planet; they’ll take the trees, animal life, water, our women or our rocks – but take they probably will. We will be little more than tiny animals to them and must hide or die. We would have to stay out of sight until they (hopefully) leave us whatever was left.

Then we rebuild, or die. Who needs communications? We’ll see... All of this of course is a bit of a flight of fancy on this author’s part in an attempt to get you to focus on something closer to home.

Yellowstone is due for a blowout. We have no clue where all the dangerous asteroids are and unless you’re a genius at chaos theory[\[28\]](#) you’re not going to figure

it out. We don't know when some random rock is going to happen by to ruin your lunch. As to the Aliens, we have our doubts they will visit us with malevolent intent, but won't rule it out. How about something more down-to-Earth, in-your-face and extremely possible, even probable? What about global economic collapse, nuclear or at least conventional world war? These things are more likely to cause a social break down, disorder, economic hardship, starvation and famine, loss of electrical grids, loss of fuel sources and other items more important to us on a day-to-day basis.

In 1929 the United States, in fact the whole world, suffered from a stock market crash[\[29\]](#) [\[30\]](#) that led to the Great Depression[\[31\]](#). Food became scarce and jobs even scarcer. America was not the only country affected by the Depression. Today as this is written America is suffering high unemployment, our deficit is in the trillions of dollars and apparently our grandchildren are on the hook to somehow pay all that money back. Detroit, Michigan is a dying city having declared bankruptcy, where it was once a thriving metropolis producing more vehicles than all the rest of the world put together. Coal production has been reduced by "Government Regulation" from the Environmental Protection Agency[\[32\]](#) [\[33\]](#) and coal-using power plants are being charged a lot of money to "meet EPA" regulations. This is more money than most of the companies can come up with, effectively putting them out of business soon. America has essentially quit drilling for oil. The price of gas has been hovering around \$3.75 per gallon and is going up and down all the time without real point of settling and staying. (Edit: Today there is a shale oil boom, gas prices are hovering today around \$2.90- Oct 2014).

America, in short is in trouble. Greece has defaulted on its debt. Other countries will follow suit. In other words, we are setting up for another world-wide economic depression from which many countries won't recover easily, if at all. As of today, and this writing, the US Government is shut down (approximately 18% of all services) and things like National Parks and Monuments have been closed by the current Obama Administration – perhaps to put pressure on the people to cause them to put pressure on Congress. At this point, it's irrelevant whose "fault" it is – but it is relevant whose "Default" it will be. (Edit: This has corrected, however, again the budget crisis approaches!)

All of these things affect us locally, on a regional basis and at times on a global basis.

During the 1960s and 1970s all of us old "Cold Warriors"[\[34\]](#) were keen to listen to the news and look for "key indicators" leading to a conflict with the Soviet Union. There were the general key indicators of such things as missile/weapons buildup, or troop buildup by the Soviets, major troop movements and so forth. There were other indications such as small wars where either the US or the USSR happened to be placing weapons into the hands of the players; proxy wars. Or our own troops were being used as "Observers" (another word for active participation in some cases). There were the routine threats, cajoling and out and out accusations by both sides. Surprisingly enough, this did not lead to a real exchange of nuclear weapons, but it sure led to a lot of table-top sand-boxing, scenario-examination and

lessons-learned. There were economic indicators as well, just like today. In the author's personal estimation, having spent a few years wandering around the White House grounds, hearing things he doesn't want to remember and knowing a lot about today's "bureaucratic administration" from the top down, we would say "we as a nation" have forgotten the lessons, ignore history at our own peril and today we are significantly less effective at coming up with solutions than we were during the Cold War.

The Mind Set in DC has changed. The politicians are short-sighted, narrow-minded, more accepting of diametrically opposed idealism or plain and simply ignorant of the lessons of history. Politicians and leaders worry more about "following a process" than they do making a decision based on the facts they have. Today, this writer has to believe if we saw incoming missiles at NORAD we'd "take the hit" without bothering to launch an immediate counter-strike in an effort to appease the enemy and perhaps not make him madder at us than he already is. Certainly we'd try to shoot them down, but, we'd not respond in-kind with similar or overwhelming force.

In general, average Americans too, are short sighted, have short-memories, and tend to believe too much "good" about "the other guy" and way too much bad about perceived enemies (or in particular the other political parties). Even today our own White House administration won't use the phrase "terrorism" when they should and surely the word "adversary" hasn't crossed the current President's lips unless referring to the "other party".^[35] Worst of all, this man won't refer to an enemy as "The Enemy". We have, as a nation, become Politically Correct Sissified Masters of everyone else's destiny except our own especially "those other guys on the other political party"; after all "we have to stop them"!

America, specifically Obama refused to help the Iranians who wanted to topple the regime there. A lot of people died because we refused to "interfere". America refused to put herself in front of the innocent people in Syria, perhaps refusing to place us into yet another war. However, Russia has put herself in front of the leader of the regime in Syria and threatening "NATO" (which is another way of saying, "You damned United States people") and are presently sending more ships loaded with Marines, attack helicopters and who-knows-what-else to protect the Assad regime in Syria.^[36] Now, a couple of years later, we have ISIS, or IS, or ISIL – or whatever you want to call them. But, hey, they are "over there and not over HERE". Right?

In our own country Americans have grown to a roiling boiling anger over "Obamacare", the closure of the Government, the spying by the NSA, abuses by the IRS, ignorance of the Justice Department over scandals like "Project Gun Walker" and "Fast and Furious". American society is crashing and burning around us; but not like a 3rd world country would do. No, there are protests, but no riots – yet. Unless, of course, you consider the racially charged riots in Ferguson, Missouri, where a policeman fearing for his life fired on a young male attacking him (and reaching for his gun) killing him. The locals believe it was a Murder by Cop; the cops believe the officer defended himself.

In recent months Russia and China have worked diligently in increasing their own military readiness as our own White House systematically disabled our nuclear retaliation capabilities, dismantled and reduced our military power, personnel and equipment, fired dozens of high level officers – in effect gutting the high level leadership of “Conservative-leaning” military Generals and Admirals. Is this the America we grew up in? No, it’s not!

The important point we’d like to press in this chapter is that if (or more likely when) something happens, it will affect not just the United States but in all likelihood the entire world, and 90% of the planet’s population. The intertwined markets around the world cause ups and downs like the world has never seen. The threat of war between two superpowers is enough to make you think “Uh oh” and yet people day in and day out around us don’t even pay attention to what is going on, let alone believe it could happen here.

Why bring this up in a book that’s about “Aftermath Communications”? Because, the Aftermath is what’s left after everything else falls apart, the subject of our next chapter. So, suspend “disbelief” for a time and bear with us a little longer. It could mean your survival.

TEOTWAWKI

The End of the World As We Know It

A good friend of mine detests that phrase, but we shall define it anyway. Another way to pronounce the title would be “The End of the World as We Know It” or TEOTWAWKI. We all know what we’re talking about here. A Yellowstone blow out would be such a thing, especially for the USA. An asteroid will ruin the whole planet’s day. An alien invasion, well, we won’t even go into those ramifications. There are a dozen other end of the world scenarios and we’ll discuss a couple of them as we go.

The world is getting scary – not that it is any scarier than it was a few years ago, just that there’s more communications in the world. We just know more now than we did in previous decades. In fact, we might even suffer from information overload now. In the old days, radio and television was the mainstay of nightly news in 1960 America. In the 1920s-1940s, newspapers were a big communication medium. In the 1930s-1950s, radio was where we got our news each evening. In the 1970’s we had the “Big Three”, ABC, CBS and NBC, but “cable” was coming out then.

Since CNN made its debut in 1980 and was the first (and for a long time ONLY) Cable News channel things have again changed. Every one of the original “Big Three” has their own offshoots on Cable Television. Today we have cell phones with cameras, Twitter, Facebook, blogs, internet news, cable news and email lists and dozens of other ways to get the word out and we DO get the word out. This is not a bad thing, it’s a good thing. A huge percentage of the daily news comes from the “man” (woman, child, teen, passerby) with a phone who photographs or videos the incident, then tweets it, Facebooks it, sends it to a news media outlet and it becomes the “Breaking News” of the moment.

What didn’t change was the “Liberal Bent” of those original television stations, including (but not limited to) CNN. In fact about the only station that is more Conservative these days seems to be Fox News Channel and it bills itself as “Fair and balanced”. The truth is each news source has its place, and none are truly balanced. Our jobs as citizens is to read as much as possible and discern the facts, not believe anyone is going to hand it all to us on a silver platter on the 6PM news – and it’s up to US to “balance” the news.

This author is definitely of a “conservative bent” but listens to everyone to get their take on things. Sometimes it is nice to know what the “Adversary” is thinking (something the present occupant of the White House would do well to consider when it comes to China, North Korea, Russia Iran and the rest of those countries of the Trans-Asian Axis).[\[37\]](#) Most important of all is not to listen to the shrill voices screaming about the end of the world by “Global Warming”. If it were true, we’d not even notice it for hundreds or thousands of years. No, the “end of the world” will happen quickly, probably without any warning at all and it really won’t end the world – just countries and civilization!

We have a situation that is on-going that we will continue to use as an example. We're not saying the outcome of this scenario will happen; only that it could and the situation is being exacerbated by the world economic crisis. Monetary bailouts to Greece will only "kick the can down the road" a bit longer until eventually Greece simply fails. For our purposes though, we need an "in-your-face" situation that few are really aware about and could cause the last and final domino to fall before "Global Thermonuclear War" takes out a large portion of the USA, Russia, UK, Australia, China and anyone else that wants to play with the Big Boys.

Russia is (at the time of this writing) currently moving troops toward Syria in an effort to prop up the Syrian regime, which as it so-happens is a puppet for Iran. Iran is working diligently, though "quietly" on nuclear weapons. In fact, they have stated recently "All Arab countries should have nukes" – or words to that effect. North Korea has had its hand in moving equipment to Iran for missiles. China has apparently sent such equipment to Iran as well. The US has stated "No Nukes in Iran" as our policy. Russia has said "Oh, why not?" and so has China.

In essence we have a situation building in Syria which is now under UN declared "Civil War", and everyone is getting antsy to "help" in some manner, the Russians by sending arms, and now Troops. The US is trying to help by telling them to "quit it!" and the UN is "helping" by screaming for some kind of help to prevent more civilian bloodshed. Unfortunately for everyone helping is they are mostly ignoring the bigger picture by concentrating on the "proxy war" that is now a fact. In fact, no one is "helping" anyone at this point. Everyone involved is forgetting that the USA and Russia both wield large numbers of tactical nuclear weapons, intercontinental ballistic missiles and rather large military forces. The US has an in-place Missile Defense Shield that supposedly works but is unproven in real combat should the Russians get more antsy than they are now.

We are not quite yet teetering on the edge of the cliff, but we're certainly creeping up to the guard rail (the one meant to keep folks with common sense on the topside of the hill). FEMA has been putting out 30 second ads lately to "get a bag" ready. They are talking about a bug out bag. One wonders why that hasn't been something they were doing all along. Now, far be it from the US Government to ever suggest you have more than 72 hours of "stuff", or guns or ammo. Never will they do that. But we will.

(Note: As we are finalizing this paper Syria has somewhat "died off the news cycle" and other things have stepped up to take its place, like Dennis Rodman going to North Korea – again – and nonsense like Justin Beiber egging someone's house.... /sigh, only in America, huh?)

If you do not have a minimum of at least a month's worth of food and water stored away, a plan, a way to contact people, and some idea of what you're going to do when everything falls apart, then you are completely unprepared. Should you "bug out" when things get bad? Maybe you should leave – if the "authorities" suggest it, then maybe you should stay home where you are if not in a target area. You should have food and water stored and probably a few weapons to defend yourself. There

are two schools of thought on this, and simply put they are “Stay Put” and “Leave now”. The circumstances of a disaster or breakdown will dictate one is safer and better to do than the other. What remains to be seen is what your personal circumstances are when the time comes to make the decision.

The reason for putting together a “72 hour” bag[38] is so you can be evacuated from your home for a few days, probably coming back when the situation has been controlled. You will not, nor will the government, control a thermonuclear war or a ground invasion by forces outside this country. Whatever happens is going to happen and 72 hours of peanut butter, crackers and Band-Aids aren’t going to do you a damned bit of good except maybe to keep you alive for a few more hours. Then again, guns don’t work against incoming missiles. We don’t think a prayer will hurt, but we also don’t expect it to stop a nuclear missile that is dropping on your head from somewhere. Personally, this author would add a weapon to his “72-hour” bag, and extra ammo, and missiles be-damned.

No matter what is happening you are probably going to want to have family members go with you. You’re going to want to get in touch with friends and tell them your plans. You are likely going to call Mom, Dad or Aunt Matilda in another state to warn them to get ready for something big, to take cover or to come to your place as soon as they can pack up their beans, bullets and bandages. Or maybe you don’t have anyone to care about but yourself. Regardless you might still make phone calls, if the phones are working. If they aren’t, we’ve got bad news for you; there aren’t any “Western Union Telegrams” any more. They stopped doing that on 1 February 2006. The only people who send messages by Morse code now are Ham radio operators (aka Amateur Radio Operators) and few of them actually use Morse code routinely. A lot of that radio traffic has moved to packet radio and other digital forms of communications. How are you going to tell Aunt Matilda to get her head down? You probably are not going too if the phones are already out, unless of course you know a ham radio operator who can get message traffic out to Aunt Matilda... (And yes, Hams DO that for free, they aren’t allowed to charge for their services).

“Cell phones won’t go out!” we heard someone yell in the background. Yes, they will. During 9-11-01 cell phones were overloaded[39] because cell towers were taken out, lines were jammed with callers, land lines were giving the old “fast busy”. [40] In any natural disaster, say a hurricane hitting a coastal region cell towers will be affected. Lightning might strike them taking them down, though most are well protected from such an event it can still happen. The wind could blow several of them down along a stretch of the coast knocking out communications to cellular towers and subscribers. Flood waters, lightning strikes and even the wind itself can take out a Central Office for land lines leaving no normal communications getting out of the area. So, don’t believe the cell phones won’t go out. Murphy’s Law says they will go out when you need them the most.

Let’s game this out. (*Note: Gaming, sand-boxing, table-topping, scenario mapping – all various names for “What Ifing” a story line through to any of several conclusions.*)

First, be aware that communication doesn't start after the disaster has already happened, or when you're running in the desert being chased by the evil fellows from the "Mad Max"[\[41\]](#) movies. Communication starts now. Once everything is falling apart, the world is fighting, people are dying and you're separated from your family is not the time to try to figure this stuff out. **Now is when you start communicating with family members and friends. This is going to be the keystone for everything you do from now out.**

*(Note: **THIS IS A TEST!** Take a break for five minutes. Grab a pen, paper and write down every person you are friends with, family members and then write down their phone numbers and addresses. **NO, DO NOT GRAB YOUR PHONE and copy it.** This is a test. 90% of you won't be able to give the phone numbers of your closest family members with 100% accuracy. Too many people store that information in their phones and 'contact lists'. If you can write down 10 friends and family members, all their address and phone numbers from memory, you pass the test. If you can't do 10 of them, you failed the test. Just for your edification, the author just tried this and HE CAN'T PASS THE TEST EITHER! This is most people, not just you. The point is that people tend to use their smart phones, tablets and computers to store information instead of their brains.)*

Now, let's continue our scenario based on real-life events (that are now going to be fictionalized to some extent); events that were happening as this paper was being written.

Russia is moving troops to Syria. Britain stops a vessel carrying attack helicopters through sneaky means – they cancel the insurance on the ship carrying the equipment and the ship just has to stop (this event actually occurred). Russia moves another ship laden with small arms, anti-aircraft weapons and troops but by this time the US has decided to intervene on behalf of the civilians, opposed of course to the current regime that Russia is helping.

The US and NATO forces, with support from the United Nations peacekeeping forces take down command and control in Syria and rebel forces begin an assault on the last stronghold of Assad but the Russians can't let Assad down. Therefore, they parachute in Spetsnaz troops (Russian Special forces) who begin defending the country's leader and warn away NATO aircraft.

Unfortunately, and it's too late for everyone as a well-placed American weapons systems not only take out the strong hold, but dozens of Russians, and the now-former Syria leader. The Russians respond rapidly and without remorse. US Warships sitting off the coast launching aircraft sorties intent on protecting the civilian population come under fire. A single, cruise missile with a tactical nuclear weapon explodes over the top of the carrier group destroying several ships, sinking the carrier with all hands. The few on the edge of the group that survive manage to get out a signal they've been nuked.

From that point on, escalation, after escalation occurs and the US protest, the Russians protest. In the meantime the war zone has gone hot, every military in every

country is now on alert, hundreds of Americans are dead and most of a carrier group is at the bottom of the Mediterranean. A real shooting war has started between NATO and the Russians.

At about 2:45 PM Eastern Time, just before the rush hour in the midst of the summer heat NORAD is alerted of “incoming bogies”, possibly Intercontinental Ballistic Missiles (ICBMs), probably armed with nuclear warheads. The Missile Defense Agency and associated military units, already on high alert do their best to destroy the incoming targets. They succeed in taking out the vast majority of the weapons, except the one that was intended to do real damage.

At 3:10 PM somewhere over the Mid-Western United States at least one High Altitude Electromagnetic Pulse weapon (HEMP)[\[42\]](#) – essentially a powerful thermonuclear weapon – is detonated. The United States is hit over more than two-thirds of the country with a powerful pulse of electromagnetic energy, an EMP[\[43\]](#). Equipment across the country has massive currents induced into the circuitry, blasting microprocessors, and CMOS devices[\[44\]](#) (transistors and other high impedance amplifier chips); huge currents are induced into the power grid burning out power transformers, generators, televisions and radios.

Within thirty seconds 80% of the computer systems in the USA are down and burned out. Most communications towers are out. Some space satellites are affected (those that were in the foot-print of the EMP). For all intents and purposes, the United States has taken a fatal blow. Cell phones are now dead. The US Power Grid has taken a fatal blow from the EMP, which in turn affects both Mexico and Canada’s power grids. Radio and television stations go “dark”, no longer transmitting either because there is no power, their emergency generators are no longer functional or the transmitters themselves are burned out.

If this sounds like a wild, outrageous and improbable scenario you would be right if this were the 1890s[\[45\]](#), or even the 1950s. But, know this: In 1895 a solar storm of epic proportions hit Earth. The only thing really affected were telegraph systems, wires strung across the country and in railroad rails. Men (mostly telegraph operators) were shocked, quite literally, as thousands of volts surged across the lines. Such a solar storm is very similar to an EMP. Of course there were no cell phones in the 1890s or 1950s, and EMP was still classified (in the 1950s) and not very well-studied. In the 1950s radios, televisions and most electronics were vacuum tube sets, simple and robust. There were no computers as we know them today. People used slide-rules, and pen and paper to do engineering calculations (as did the author). America was simpler then, had nearly nothing we’d call technology. America was slower, and people were certainly more spread out around the country than today in the 21st Century.

This is not a wild, outrageous and improbable scenario, in fact it’s very much happening at this minute, except of course for the EMP burst, which has not yet happened (since you’re reading this article, which will be available in digital format. If you’re reading this it probably didn’t happen...yet). But EMP is certainly a viable option for the Russians to use. While we in the US pride ourselves on not being the

one to use nukes first, we can't be so certain about the Russians. We can't be certain the Chinese wouldn't do the same thing and for the record the Chinese and Russians are certainly working together today to amplify their military forces by training together and sharing information.[\[46\]](#) Both countries are known to have studied using EMP against THEIR adversaries... who happens to be the United States of America.

Continuing on with the scenario, we would find that many vehicles no longer work, some do, some don't. Most modern cars and trucks do not. We would find that a great majority of any electronics we had such as our iPads, iPhones, tablet computers, laptop computers, desktop computers, and land line telephones are out and no longer functioning. Some testing shows that anything attached to the power line is no longer working. There are no visible signs of damage, or perhaps a few arc-marks here and there. We can't buy gas because the power is out and the pumps aren't working. The occasional generator is working here and there and some people have lights as evening falls. Others have nothing turned on, because the power grid is dead.

Refrigeration isn't running, so people are moving their frozen foods to coolers with whatever ice they can grab from the local stores and that was almost all gone about three hours after the lights went out. People in your neighborhood are standing around talking, trying to figure out what happened. One man has a small portable, crank-generator radio. He is the local ham radio operator and is passing out information he knows. His radio is working. Your stereo isn't working even with your functional generator. The Ham says his little radio was stored away in a metal box for "just such a situation". Your own preparations were minimal. You bought a gun, you have some beans and rice stored, not much else except whatever was in the pantry. Your grill works, but you only have a half tank of propane left even though you have two tanks. You just kept putting off getting the other one filled.

Suddenly a commotion down the street starts between two of your down-the-street-neighbors. They are shouting and shoving and then someone tries to break it up. A gun goes off and one of them falls, shot through the heart. The man with the gun turns around and calmly walks off. A woman screams. It's getting dark outside. There are no police, there are no telephones. No one tries to stop the man with the gun. This is the first night of what is going to become hell on Earth in a few days. Several people try to help the downed man, but one pronounces him dead. The screaming woman was his wife and she's sitting next to him, crying, and rocking his body.

The Ham Radio Operator shakes his head and says, "Well, it has started. I've got to go. Good luck." He turns to leave then starts loading stuff into his old SUV, which seems to be working for some reason. You sit on your porch because it's just bloody hot inside your house and watch him finish packing up, loads his wife and a young man, his son, into the SUV. The young man is armed with a shot gun; the Ham and the woman have side arms. As they drive off you see the words "diesel" on the back of his antenna covered SUV. You never see them again.

Of course this is just a scenario. While on its surface it sounds science-fiction-like, it isn't. This is a real and true possibility and it could happen tomorrow. While you can sit in your own arm-chair and deny this would happen, you'd be wrong. Would you be prepared? Would you have enough food, water and some way to communicate with your family members? The answer is "Probably Not" if you're reading this. If you're still denying it could happen, that's OK. Go on back to your TV show and put this book away as it isn't for you. It's for someone else to worry about.

For those of you still with me, this story line is set up and we need to understand something important here. This paper isn't just "another survival guide". It's really not about "preparation", storing food, collecting ammo, or water, or how to do those things in a primitive fashion when there is no power, lights, cars, gasoline or anything else. What you need to grasp is that if such a scenario comes to pass, and it will eventually, more than 50% of the human population of this country will die off within a few days. Most people within a few miles of your own home will be unprepared, affected, and shocked "it happened here".

With no hospitals (no power, remember?), there will be no medical care and those on essential medications will die (no deliveries to the pharmacies), those requiring oxygen tanks (no gas for delivery trucks) will die as will those who are undergoing cancer treatments (no availability of the drugs) – which will cease almost immediately. Starvation, murder, lack of water, illness, over-heating, or freezing to death will take the rest. **This paper is about thinking, considering the possibilities, not about trying to deny things will happen (or won't) but to actually stop and believe for a minute that we're always thirty seconds from "The Day After".**[\[47\]](#)

Normal, healthy people who have no medical problems certainly will survive the initial die-off, but then there are those pesky Russians out there who nuked the country in the first place, or the Chinese, the illegal aliens, the Mexican drug cartels, street and city gangs, US drug gangs, organized crime with guns and the random nut case with a gun out there who knows he has to eat to survive and doesn't hesitate to start shooting anyone who won't give him what he asks for. Things will get out of hand quickly, much faster than you can imagine.

Oh sure, at first people will help each other because Americans are like that. Some will quickly mobilize to help themselves and others. But that won't last long in a long term condition with no electrical power and no way to get anywhere except by foot. Things will change when the food and water begins to run out, rapidly and without exception to race, color, social status, wealthy or poor, prepared or unprepared. There will be gangs that are "ready" and prepared to start robbing, looting and killing the first night, if they think for a second the power isn't coming back. There will be those, who have some military training, friends and guns – and they become the "gang no one wanted to see". They will become the worst of the worst, looting and taking everything they can, killing other gangs, cops, citizens, civilians, the dog down the street, and any living thing that could be a threat to them in an effort to take

control of the area, city or even state. Yes, those kinds of people do exist even if you want to disbelieve in them...

The US military is busy somewhere else, hopefully fighting and preventing a full scale invasion. They are not coming to your assistance. FEMA is like everyone else, hamstrung and the country is a big place when the power goes out, without planes and vehicles to get there. Besides, they don't know you're there and worse they are big government agency that really is probably more mismanaged than your hedge fund is. Many of the police and firefighters have gone home to their own families. You are on your own and unless you find water and food, you too are going to join the growing ranks of the dead. The Government isn't going to help you. The fire department isn't going to help you. The police department isn't going to help you. The mayors, city council, Congress and the President aren't going to help you. No one is riding in on a white horse to rescue you, your spouse or your children. Your gold fish is probably going to be food soon, and so will your cat and dog. If you don't eat them someone else will.

This is what we call TEOTWAWKI; this is the day, and all the days afterward, we call "The Aftermath". There won't be a distinction between everything falling apart and what is going on the next morning. Everything will continue falling apart if this is the big one. The US military might pull back to the US and contain whatever is happening. Or they might not. In the next chapter we will discuss this scenario a bit more but in terms of communications equipment, what might work, what probably won't work and why and how you can prepare before something like this occurs so your equipment does continue to work.

EMP

What is Electromagnetic Pulse?

Over the course of the past few weeks while writing this, I've been approached both in email and in person about "global communications that will survive a nuclear blast" or "EMP attack". Folks are indeed concerned and thinking, finally. People I would never have considered asking me such questions.

An **electromagnetic pulse** (EMP), sometimes called a "transient disturbance", is a short burst of electromagnetic energy. It may occur in the form of a radiated, electric or magnetic field or conducted electrical current depending on the source. Electromagnetic pulse is commonly abbreviated **EMP**, pronounced by saying the letters separately (E-M-P).

Typically, we would expect an EMP attack on the United States from a foreign state using thermonuclear weapons, likely placed into orbit or coming in via an ICBM, and being detonated high in the atmosphere.

Another possible source of EMP might be the sun itself. The sun occasionally spits out vast amounts of energy captured in a magnetic "bottle" of sorts. If that stuff, called a coronal mass ejection (or CME) hits the planet where there is a population and electrical grid – the grid could be damaged severely or even permanently. Nearly anything plugged into the wall sockets at the time will be damaged or destroyed.

On March 13, 1989 a severe geomagnetic storm caused the collapse of the Hydro-Québec power grid in a matter of seconds as equipment protection relays tripped in a cascading sequence of events. Six million people were left without power for nine hours, with significant economic loss. The storm even caused auroras as far south as Texas. The geomagnetic storm causing this event was itself the result of a coronal mass ejection, ejected from the Sun on March 9, 1989. (<http://www.solar-facts-and-advice.com/coronal-mass.html>)

In 1859, long before the modern computer age, telephones, television and radio another event occurred that affected telegraph systems, set fires in telegraph stations, and cause electric shocks to some telegraph operators. The event, later called "The Carrington Event" was caused by a combination of a solar flare and a CME that hit the Earth around 18 hours after being recorded.

This geomagnetic storm is the largest geomagnetic storm ever recorded. It was recorded by the Colaba observatory near Bombay, India. There are records in Boston that the light from the event, the aurora, was so bright that even at 1:00 AM it was possible to read a newspaper without any other source of light.

There are man-made methods to create an EMP, but they will be localized to a small area, probably smaller than a city block.

The one we will concern ourselves most with will be a direct nuclear attack and the deliberate creation of an EMP using a nuclear device (yes, it too is 'man made' but very large) to disable or destroy the American electrical grid, computers, communications, command and control of the military.

In the first place, nothing will survive a direct nuclear blast. Not nothin', not no how...

Anything outside of the blast radius however probably will survive after the initial blast, Gamma ray burst, fire storms, fallout and floods that will ensue. But the

goal of an enemy isn't necessarily to destroy the USA, rather to bring it to its knees and then invade later, taking over the still-intact infrastructure. In this case there won't be many, if any, direct nuclear strikes. Instead the enemy would direct nuclear bursts at high altitudes across a couple places in the US. This would be by overlapping EMP bursts to cover as much of the United States with a footprint as large as possible thus destroying as much of the communications infrastructure of the US as possible.

The military has hardened equipment – that is, radio and computer gear that won't be affected because it has circuitry that is protected from EMP and voltage spikes. Consumer equipment won't be so lucky. Everything from video recording equipment, security cameras, monitors, computers, and iPods to computer tablets that are exposed to the EMP can be damaged. Your AM/FM radio in your car will likely stop working. Your car, truck, SUV, the buses around you and most vehicles containing computers will stop working. Anything requiring a computer system will stop working. Airplanes will fall from the skies. Vehicles that do not count on computers will continue on their merry way, like trains, which will no longer be under computer control, unless emergency hardware shuts down the machines. Electric trains will stop in their tracks.

GPS satellites will cease sending their signals. GPS receivers on the ground will stop receiving the signals from the GPS satellites. Satellite communications will quit. Cell phones will stop functioning. Even your digital wrist watch will, in all probability cease to count the seconds.

Our main goal is to make sure our communications equipment works AFTERWARD; in the Aftermath.

Let me state right off that ANYTHING and I DO MEAN anything that contains microcircuits is, in all likelihood susceptible to electromagnetic pulse. This means your wrist watch, your handheld radio, GPS unit, laptop computer, desktop computer, 99.99% of all cars/trucks built after the 1980s, motors, generators, solar panels, microwaves, television sets (especially ALL newer flat screens), printers, telephones – both cellular and home land lines. In other words, a well-planned EMP attack on the US will obliterate, destroy and disrupt nearly ALL communications we use today, especially if they are plugged into the power grid. The power grid, all those wires delivering the AC power that comes to your home, is basically an extremely huge antenna system. Even a "coronal mass ejection" (CME) from the Sun could cause a grid problem similar to an EMP (as we saw in the "Carrington Event" and the 1989 Québec event).

Cellular phones, which number around 310 million in the US in use today (as of October 2013) will simply cease to exist as a communications system. Towers and phones themselves will be useless, at least as Cellular Towers.

So the question of what will work after is sort of moot. What will possibly work?

The answer is that most equipment containing vacuum-tubes or anything that has been semi-protected or deliberately protected from EMP. Look around you. How many of you actually HAVE equipment in your homes that still contain vacuum tubes? In reality, if you have an older television set, the picture tube is probably a cathode-ray tube (CRT) and that is a vacuum tube. Unfortunately, most of the guts of the TV will be semi-conductor stuff. Your microwave has a tube (the klystron) which generates

the ultra-high frequency radio waves (microwaves) used to heat your coffee or cook. But the rest of the microwave, like the timer, the digital display and push button parts will all be semi-conductor and are unprotected. (The inside of the microwave oven is actually a Faraday cage, and could be used to PROTECT small electronics inside the oven, as long as you don't turn it on!)

The fact is almost no one has vacuum tube radio and television equipment sitting around anymore. We threw it all away, because that's how we are in America now. We don't fix things. We trash them if they look old or we consider them "obsolete" (even if they aren't). We toss out radios, televisions, phones, whatever, and buy new ones. *(Note: When I was a young man in Jr. High and High School, I walked up and down the alley ways in my home town with a wagon collecting old televisions and radios, which I would then refurbish and sell once I repaired them. Usually I replaced a tube, or a capacitor. Eventually I made enough money to open a small TV shop which I sold before I joined the Air Force at the age of 17. Today, it's nearly impossible to do such a thing; everything is designed to be thrown out...).*

If you are trying to locate radio transmitting equipment you should be looking for older stuff, radios with vacuum tubes. Vacuum tubes are immune to high energy pulses, unlike semi-conductors like transistors and microchips.

Where would you go to get such things? You might go to eBay or Craigslist but it seems it is pretty expensive because people want top dollar for junk stuff – they call it "antiques". What this tells me is the stuff built in the 1930s-1950s were worth something then and even now. How many times have we seen people standing in line for the newest "iPhone"? Bet no one stood in a line or slept outside waiting for the new "touchtone Princess Phone" did they?

Another, probably much better place is to frequent any local area ham radio swap fests, also called a Hamfest. This is a place where local amateur radio operators get together a few times per year to trade and sell old equipment. Some is junk, some collectable. Be wary, and make them show it to you working.

You can check with local area clubs (do a Google search on ham radio clubs with your city, county or state name or go to the ARRL.ORG web site and look for listings there as well).

Once you find the dates (usually weekends and sometimes the preceding Friday) show up. Most will charge a 5 dollar entrance fee (or some other fee, to pay for the rental of the location) and they also charge a fee for the tables for the participants selling equipment.

Wander around, get to know the hams, ask questions and ask to see the radio(s).

Some might be hesitant to sell equipment to an unlicensed person too – so be very aware of this when asking questions. You can outright fib to them and say it's for your uncle or dad, or third cousin "And I don't remember his call sign but he collects stuff like this" or you can say YOU are collecting stuff or whatever. Most won't care if you're a ham or not.

Prices of equipment will vary from very inexpensive to outrageous. Most will be happy to trade, barter or dicker over the price.

Ask them to demonstrate the equipment to you. When you find a piece you like, that works, and you're ok with the price, buy it. Check around for spare tubes or other things you might require to make it operational (wire for antennas, microphone if not with the unit, and so forth).

Basically... unless your radio systems are attached to long antennas like mine are, you're NOT going to lose everything. It could randomly affect things as stronger signals might be felt nearer to the bomb blasts. Essentially EMP travels a long distance, but is affected by the same thing other radio wave type signals are — physics.

The *Inverse Square Law* affects all wave-like signals. Including EMP. EMP will be a problem, but it will not affect every piece of electronic equipment.

IF you want to be sure, package at least one radio inside a grounded metal box... make sure it hasn't any batteries in it (to prevent them from leaking) and store it away. Extraordinary measures are not necessary to protect electronics systems. Anything plugged into the wall, connected to antennas outside, and generally hooked to anything that has a long wire connector **will** be affected.

Finally – go here: <http://www.transasianaxis.com/showthread.php?2173-E-M-P-%28EMP%29-e-m-p-emp-Electromagnetic-pulsefor> a discussion on a forum about EMP.

As always, I advise strongly to print out hard-copies of important material. Make a 3-ring binder and protect it from water damage. If computers go down, this digital data will be rendered useless.

Below are a handful of resources to read:

<http://www.aussurvivalist.com/nuclear/emp/protection.htm>

<http://www.globalsecurity.org/wmd/li...t/1984/ERD.htm>

<http://www.fas.org/spp/starwars/cong...h/h970716u.htm>

<http://adsabs.harvard.edu/abs/1988STIN...8912791A>

<http://www.qsl.net/n9zia/emp.html> ** check this by a ham radio operator

http://www.animatedsoftware.com/envi...w/nuke_war.htm

Transmitters, receivers, transceivers

What they are; how they are used; how to protect them

In the previous chapter we mentioned a “neighborhood Ham Radio Operator”. They have gotten a bad rap in television programs, movies and other venues as the neighbor who is a weirdo, living in his mother’s basement, the geeky guy who is too fat, eats too much junk food and picks his nose. There are of course men (and sometimes women) who are the embodiment of this description, but they are few and far between. In fact, Amateur Radio Operators (the proper name of “Hams”) are actually pretty smart folks, hold a license they have to take a test to get, have to study hard and know their material to get through the tests. They know communications inside and out. Not all are experts on every single subject related to radios, but they are experts on portions of it. Some know it all and some are “know-it-all’s”.

Hams (we will continue to use the phrase “Ham” instead of “Amateur Radio Operator from here on out, because ham is short!) are public service oriented people, they belong to organizations like “Amateur Radio Emergency Service” (ARES), Radio Amateur Emergency Service (RACES), Skywarn and other organizations that help the public safety through communications. As this paper was being originally drafted the first time there were multiple wild fires in Colorado and Hams were right there in the thick of the smoke assisting fire departments, police, sheriffs and other served agencies such as the Red Cross to coordinate movements of units, food, supplies and to help ensure the safety and protection of the public who have been evacuated from those areas. This author has personally operated radios during wild fires in Colorado as well as worked closely with the National Weather Service’s (NWS)[\[48\]](#) “Skywarn”[\[49\]](#) program.

Skywarn Hams are trained every year by the NWS to be the “eyes on the ground” where Doppler Radar[\[50\]](#) can’t reach in many cases for confirmation of severe weather activity all over the United States. Particularly in Colorado the Doppler radar can’t see “over the mountains”; areas that terrain is blocking the radar signals. Many states in Tornado Alley have very active Skywarn groups (note, you do not have to be a ham to belong to Skywarn, contact your state or regional offices of the National Weather Service for more information in your area).

Hams are, by their very nature, prepared for many things. While most people see ham radio as a “hobby”, which is to a great extent, they don’t see the underlying background of Amateur Radio itself. The Amateur Radio Service[\[51\]](#) is mandated by Congress, rules are set by the Federal Communications Commission and most countries that have joined the 20th and 21st centuries have hams. Those in other countries have their own regulations set by their own version of the FCC.

Hams practice various forms of communication from the old standby Morse code, to single-side band voice, to various digital modes of operation. There are even

“tracking” and mapping programs that let hams know where each other are on a graphical map (Amateur Packet Reporting System, or APRS). There is a system called “Winlink2000”[\[52\]](#) which has various modes of operation and means of getting messages in to and out of central email servers so that people can communicate anywhere, in emergencies. In fact, emergency communications (EmComm) using Winlink and other “systems” is constantly being test, updated or modified to make things easier (or complicated on occasion!) and the best methods remain tried and true, the complications tend to die off.

Hams are, without a doubt the ONE thing that will keep going when the Excrement hits the Impeller Device. Why is that, you ask? It’s easy. Hams know their radio science. They know what EMP is; they know how to prepare for it. A lot of hams own old, even antique equipment that operate using vacuum tubes. Some of you might not even know what a vacuum tube is. Vacuum tubes are glass bottles with a filament and other tiny bits (called ‘elements’, but not like the elements you learned about in High School Science Classes) inside made of metal and are used in the same manner as transistors. Vacuum tubes are impervious to Electromagnetic Pulse, and sometimes even a direct lightning strike (which is similar to an EMP). There are differences in EMP and Lightning strikes making electronic equipment easier to protect against lightning than EMP.

Hams know that if something really bad happens that takes down the power grid they need a generator, solar panels, batteries and other power sources. So in general hams will have some kind of backup power system above and beyond commercial AC power sources in case of an emergency. That way they can still transmit and receive signals. By the way, solar panels ARE susceptible to EMP!

Hams know antennas. They know you don’t have to go out and purchase expensive antenna systems and that you can make a simple wire antenna (long wire or dipole antenna) instead of a vertical tower, pipes and other complex rigging that might be either an eye sore or attract unwanted attention (more on unwanted attention later).

Hams know how their radios work and are in general willing to teach you too if you’re not a ham and have no clue what any of it is about. In fact Amateur Radio is more or less a dying “hobby” because there is so much new technology, computers, cell phones, texting, voice mail, Facebook and other social networking that most people don’t think Ham Radio is worth the bother any more. Who wants to listen to a lot of noisy boops and beeps on a speaker to figure out the letter A is a dot and a dash anyway? Well, in truth, the hams want to. Even they don’t really use Morse code as much as it used to be used, and learning it is no longer a requirement to hold a ham license either, it is still an accomplishment to send messages using dots and dashes!

Morse code is the simplest form of communication besides speaking face-to-face. After the nukes go off there will be something called “Ionospheric Scintillation” which will cause massive interference of any kind of radio signals. Audio signals riding on radio waves will be so distorted that there might be nothing intelligible.

Morse code is a simple, on, off of the carrier wave (the actual radio signal itself) and can be picked up through massive noise.

In fact, Morse code is the **only** signal we considered in the military to be a viable signal to “get through” when nothing else would work. Unfortunately for the United States military the Navy, Air Force and other services no longer routinely teach Morse code to military personnel, Morse code (also known as Continuous Wave[\[53\]](#) or CW) is no longer required for Amateur Radio testing or on ship-to-shore communications tests for Communications Officers. Pilots don’t use it much now.

Should you learn Morse code? If you want to ensure you can get a message through to the far side through nasty atmospheric noise then the answer is yes. But, who is at the other end and do they know Morse code? There is probably not going to be someone there, except the ham radio operator, or someone who happens to know it or can figure out what you’re trying to say.

When it comes right down to it, do you need to have transmission capabilities? Or can you just be a “receiver” and collect information for your local neighborhood survivors? What should you know and do?

Let’s explain what radios do before we go any further.

A receiver is any sort of radio that can pick up and “receive” radio signals. A transmitter is a set of radio circuits that create the Radio Frequency[\[54\]](#) signal (RF) and then send that signal to the antenna. A transmitter also has a way to “impress intelligence” upon the RF signal. “Intelligence” (contrary to what we sometimes hear on the news today...) is information or audio, or even digital data, added to the radio frequency signal and sent to the antenna. That RF signal is then radiated to the air in the form of an “electromagnetic wave form.”

A transceiver[\[55\]](#) is a combination of a receiver and a transmitter, in one package capable of both transmitting your signal out, and receiving that of your friends (or enemies) back in at the same antenna. Some Hams might have receiver and transmitters in separate boxes connected to relays and switches to use one antenna, and so forth, but this is well beyond what you want to do for simplicity.

What good is a radio going to do you in the Aftermath? We would hope its most important use would be to collect information about what is happening around you, either close by or somewhat more distantly. FEMA[\[56\]](#) [\[57\]](#) recommends everyone have some kind of portable radio put away in their “GO Bag” or bug out bag. But they give no instructions on how to use them, or store them! These radios should have batteries stored outside of the radio. The radio should be kept inside a package you can pull out, open up and then install the batteries into the radio. You would do this to prevent age and disuse (because you know, a Go bag is used ONCE, if ever....) and batteries tend to leak and destroy your equipment if you leave them inside the radio for eight years without checking them! (The author has done this himself, left batteries inside things and forgotten about them. Bad news....yuk!)

A radio with a hand-cranked generator[\[58\]](#) (which charges an internal nickel-cadmium or Lithium-ion cell for power) is good to have so that if you run out of batteries (which you will eventually in an Aftermath situation) you can still get the radio to receive. These radios in general can be had from Radio Shack[\[59\]](#), Baygen[\[60\]](#) and many other places that sell radios. Usually they are called “Emergency Radios”. They almost all have AM, FM and some shortwave bands on them.

A Transmitter, without a receiver is pretty useless to most people. You can broadcast a signal, but you will never know if anyone received it, unless it was the bad guys targeting your radio signal to lob a nuclear weapon on your head... more on this in another chapter though.

An example of a transceiver is the Citizens Band (or CB) radio. There is usually a 5 watt transmitter and a receiver built in to these units. They are short range (under most circumstances) and usually have “forty channels”. A channel is simply a specific frequency assigned to that “channel number”.

That’s the basics. There are many, many sorts of radios, and receivers that someone could buy, own, use or stick in a closet. This author has a lot of such radios (sitting in closets) that rarely get used. There are scanners; both desk top and handheld models exist. There are AM and FM receivers, most cars have them. There are shortwave receivers. There are marines radios (usually found as a transceiver only, and generally as a handheld radio, but there are “mobile” rigs as well). There are televisions (these days, they are digital receivers). As a side note, older analog televisions are technically nothing but “radios” but they have circuits that detect and convert signals into a video you can see (hence the “tele” in television which means “far sight”).

With all this information, what in the heck do you want? Well, that is the question. It’s ultimately up to you to answer though – but we will continue to give you information to assist you in answering your questions.

Let’s talk about “modes” and “modulation” or the method of signal transmission, and what each means, how they are used and what might be useful to a “survivalist”. **Modulation** is the method by which the intelligence (audio, music, sound) is impressed into the RF signal. This is how the audio (the intelligence we’re calling it) is added to an RF signal. Of course, **RF is Radio Frequency** and this is the energy the transmitter creates to send a signal through the air; also called “airwaves” and “radio waves”.

A mode is the method of transmission like AM or FM. These are the “common” modes most people are familiar with on your stereo or car radio. AM means Amplitude Modulation. FM means Frequency Modulation. Each of these two signal modes has advantages and disadvantages. But to complicate matters there are “frequency bands”. All the “bands” (groups of frequencies) can use any “mode” but some are better suited to some modes than others. We will examine each one.

AM radio (also called Broadcast band) has a frequency range of 535 kilohertz to 1700 kilohertz. These are lower frequency signals and can be heard for many,

many miles especially at night. If you want to test this, turn on an AM radio late at night and tune around. Don't look for the strong, local signals, instead seek out the weaker signals and music and listen for a while. Eventually there will be station identification and from that information, the frequency shown on the dial and the internet you can figure out where that station is located. If you knew a bit more, you could actually triangulate your location using this information (or conversely the location of a particular station if you could move around and get more than one bearing from your location). We'll talk a bit more about radio direction finding later.

AM signals are usually noisy because of how they are generated. Lightning storms up to several hundred miles away can be heard, especially at night and in the summer months in the northern hemisphere as "static crashes". The AM Broadcast band is located at the bottom end of the "High Frequency Shortwave Bands". (Are you confused yet?)

FM signals are different. Instead of "modulating" the RF "carrier" signal, that RF is "deviated". (Technically, this is still a form of modulation.) Without going into the scientific details, suffice it to say that FM is a "quieter" signal. The normal "FM Radio" you're used to starts at 88 megahertz and goes up to about 108 Megahertz (Mhz) on the radio dial. FM radio signals are not bothered by "static crashes" like AM. FM is better suited for high fidelity audio and music than AM, because it is quieter, it uses a higher frequency and wider "bandwidth", allowing more "intelligence" to be impressed into the RF carrier signal.

There are much higher frequencies which are in the Very High Frequency band (VHF) and are generally very short range, what we call "Line of Sight". Line of Sight (LOS) means "If I can see the antenna, I can hear it" (and conversely, "If I can hear it, I can probably find the antenna visually). Radio signals do tend to "bend" a little along the surface of the earth so the higher you can place a VHF (or higher frequency) antenna, the further you can "see" your receivers or more accurately, the better the receivers can "see" the transmitted signal. Higher antennas however become "bigger targets". – Later we will cover more on "When not to use communications".

Another mode is called "Single Side Band" (SSB) and again because of limits of space in this paper and time on the part of the author, we won't go into the deep, technical and scientific details of precisely what "SSB" is or how it works, only that it is a mode and uses part of an "AM" signal to make a tighter bandwidth signal that can cram more energy into a smaller space. For our purposes SSB signals are used by the military, ham radio operators, aircraft, ships at sea, some shortwave stations and some CB radios. An SSB signal can go further because it has more "punch power" in the radio spectrum. You might have heard the "Donald duck sounding" signals on a CB or shortwave. This is, in all likelihood an SSB signal. You need a special receiver (one that re-inserts a carrier wave back into the received signal to help decode the received audio out of the signal) to hear what is being said.

Already mentioned before, but once more for clarity here is Morse code or Continuous Wave. CW is simply an on-off keying of a transmitter. The receiver will

only hear a “puffing sound” unless the radio is equipped with something called a “Beat Frequency Oscillator”[\[61\]](#) which re-inserts another signal with the “puff-puff” sound and makes it sound like beep-beep instead. Technically this is what we call “signal mixing” or “heterodyning”[\[62\]](#) and gives us an audible sound instead of a puffing sound. (The BFO can allow you to heard SSB signals previously mentioned.)

Morse code can be sent around the world on very tiny amounts of power. The author has operated a 1-2 watt transmitter (in ham radio, called a QRP radio)[\[63\]](#), powered by a solar panel and a wire antenna strung in some trees on the side of a mountain in Colorado to talk to Japan on CW. In The Aftermath, you will most certainly find my signals somewhere on the radio band broadcasting the “local conditions” of my area to my friends somewhere else in the world. That is assuming I survive first strike, am not at ground zero, the gangs don’t get me, I don’t starve to death or one of my neighbors doesn’t shoot me in the dark....

So, here we have some various modes of operation (usually based on the frequency of the receiver) and types of radios defined here. We also know that a receiver is for collecting helpful information from broadcast stations or other people who are sending that data out. A transmitter is a radio signaling device that SENDs information out. There are good things and bad things. The pros are you can send information about your location to get help. You can tell people what the conditions are at your location (which might help them determine what their conditions are soon to be like if they are east of you in a western prevailing winds as in North America for example). On the Con side, you can send information to get help, which might get to an enemy. Then you won’t get help. You can send information about your location, which the enemy can get thus removing what tiny amount of security you had before you sent the signal. Lastly you can send information about your location’s conditions which might tell the enemy just how bad (or good) off you happen to be at the moment.

As you can see radio communications can be a double-edged sword.

What won’t work after an EMP? A lot of equipment will not work. Computers, laptops, cell phones, some wristwatches, most television sets, radios and almost anything that contains integrated circuits will stop working. Even cars, trucks, airplanes, some boats, GPS, calculators, microwave ovens, stereos, iPads, iPods, cassette tape players (does anyone still have one of those?) and a multitude of things not mentioned here. Basically, this includes any device that requires a battery or an AC plug, an item that uses transistors, integrated circuits and other small, insignificant electronic parts.

Apparently those parts weren’t all that insignificant! Let’s try to understand why this equipment just quits working when you never even saw a nuclear flash, heard a bomb, or noticed the neighboring city being vaporized. This gets a little technical but we’ll try to keep it simple.

To understand this requires a bit of science, a little physics, some electronics and even a small amount of chemistry – but we’ll skip the math because it won’t really

help much. Most folks know that you can use a magnetic field to induce current into a wire and many of you might have done an experiment in elementary or high school science classes (that stuff most of you paid NO attention to at the time) where you wound a wire around a compass, and a distance away down the wire you wiped a magnet back and forth over the wire causing the compass needle to swing wildly. You might have connected a voltmeter to the wire instead and gotten similar results, as a current was induced into the wire. You might have connected a battery to the wire and watched the compass needle move as well.

Even if you didn't do this, you can take our word for it, this works. Why it works isn't a mystery either. To simplify things a bit, a magnetic field will induce a current into a wire. A very large magnetic field will induce a very large current. Transformers (those ubiquitous wall-warts everyone has plugged in everywhere these days to charge phones, laptops and tablets) work the same way. Alternating Current (AC) is applied from the wall socket, which in turn creates a magnetic field, which then induces a current in the secondary of the transformer (a secondary coil that is). If you use fewer turns of wire on the secondary, you "step down" the voltage (which is how we get a 12v or 9v dc output instead of all 120 volts of the wall socket). That voltage is then changed in various ways to make it useful for small devices (technically, it is usually changed from alternating current to direct current and filtered at that point).

Now picture a very, very large and powerful magnetic field, more powerful than anything you have ever seen suddenly being created, moving quickly away from its creation point (in this case, a High Altitude EMP device, or nuclear weapon detonated high in the atmosphere). This electromagnetic waveform contains two components, an electrical field and a magnetic field. The "pulse" generated is a rapidly increasing signal that forms the EMP. In fact, this EMP is identical in that aspect to almost all radio waves! Except powerful!

Any wire or metal component in a circuit that has wires attached to it, power lines, any other piece of copper (including your water pipes above ground) and other plumbing in the home, workplace or outside facilities will be "touched" by the EMP. As the field crosses any piece of metal (railroad tracks too, copper wires, your computer case...) a huge current is induced into the metal/wire/case/etc.

This is the "pulse" part doing its job. The current induced will travel to, through and down to a grounded connection in any circuits exposed to the pulse. Voltages can be millions of volts, generated for an instant. Computers and other such devices operate on 5-12 volts with current usually measured in milliamperes (a measurement of current, a fraction of an Ampere or Amp). Millions of volts can push many, many Amps of current burning up sensitive circuits like microprocessors and memory chips.

Some more expensive electronics will have "surge protection" and this might help prevent that equipment from getting blasted. But probably not because the EMP will also generate massive voltages even on circuit boards inside computers, inside the components themselves (like the microprocessors) and any other part that is not shielded. Transistors and microprocessors (which contain millions of transistors) are

called semiconductor devices. Without going into the chemistry involved here, the components are made in such a fashion that there are “gates” and “junctions” of various material mostly made of silicon. Silicon gates and junctions are “high impedance” and usually block the flow of current in one direction but not the other. All of these devices are conductive to some degree and all will allow current to be induced at various levels in the moving field that is EMP.

Because the voltages generated are in the thousands or millions of volts, a tiny spark will burn holes in these gates and junctions thereby rendering the devices burned up and useless. Picture millions of transistors in your microprocessor inside your computer or iPad sitting in the microwave oven when you turn on the microwave. Those parts are going to go “Pfzzzzzt!” all at once. There is nothing you can do to make that thing work again. It’s toast! This is almost exactly what the EMP is going to do to your equipment. One pulse, one thousandth of a second long is all it will take, if it is large enough to blast all those little parts inside your radio and computer back into plain, old sand (silicon).

Radio antennas and power lines are particularly susceptible because antennas are designed to pick up electromagnetic wave forms (in the form of radio waves). An EMP is a close cousin and will happily induce current into wire (pole, pipe and tower) antennas as easily as the designed-for frequency will do so! A radio or television receiver connected to an antenna will most likely be destroyed instantly. Power lines are close cousins to antennas. After all, they are long, copper wires hanging in the air and can easily pick up radio signals.

Of course our description is somewhat simplistic because there are several components to such a waveform and a part of it will be what destroys the electronics. The point remains EMP can be produced and will destroy almost all electronics. So what can prevent EMP from taking out everything you own? Not much. Most people carry their phones everywhere, laptops go many places and iPads and other tablets travel everywhere with the owner. (The author carries his tablet everywhere but to his daily job, and many portions of this paper were written on a tablet.) Radios and televisions are connected to antennas, cable, DirecTV® or other satellite dishes (which are also antennas) and no one routinely disconnects their receivers, ever.

So can you protect your equipment? Not easily, especially if it is in daily use. You can however protect emergency-use equipment by storing it in a box that is shielded. This is the simplest way to do it. Take a metal box, put your device(s) inside and close it. You have to make sure it is securely closed. Some folks have advocated the use of an old, broken microwave oven for storing stuff inside. Placing the unused microwave in the basement or at ground level will help to further shield the equipment. We have not personally tested this, but in theory it should work. This is, of course, a solution to storing equipment for the Aftermath, and usually a severe inconvenience to those wishing to use the equipment on a daily basis!

(Note: microwave oven interiors are nothing more than a radio shield, also called a Faraday Cage, keeping the microwave radiation, a radio frequency at about 1.2 Gigahertz[\[64\]](#), inside the box to cook your food or warm your coffee. The buttons

and electronics are outside that shielded area and thus are susceptible to EMP. But the shield should theoretically protect equipment inside the box from massive EM pulse outside the box, especially if the shield is grounded.)

Our suggestion would be to make sure you place your special crank-power shortwave, your calculator, a laptop, tablet computer, thumb drives or anything you want to survive the EMP inside such a box and forget about them until you 1) Need to update them 2) need to make sure they work, or 3) need to use them in the Aftermath. This is impractical for daily use items and the main reason daily use items will cease functioning because you won't have any warning of EMP.

Using this EMP scenario accomplishes two things for the purpose of this book. The first is to present a real and present danger at face value and the consequences of such an incident. The second is to demonstrate that even in the direst of circumstances, ***some things will still function***. Some radio systems will function – but power grids may be completely demolished. Airplane navigation (ships, trains, cars, trucks) will mostly stop completely. Airplanes dependent upon electronics to keep them in the air will, quite literally fall down moments after this incident happens – especially super airbus type aircraft whose instrumentation is almost all computer touch screens. Satellites outside our atmosphere will be affected as well, effectively shutting off all satellite communications that happen to be in the “footprint” of the EMP device. Not every satellite will be affected, those in the shadow of the Earth (over the horizon from the EMP) will be fine so some satellite communications should still be useful after such an incident. This includes satellites that are polar type orbits, going round and round the Earth and not in the region of the EMP foot print.

Anyone, any person whose life is dependent on electronics (pacemakers anyone?--pacemakers are full of electronic circuits) will likely die moments after the EMP hits them. Thousands of Americans use pacemakers and medical defibrillators. They will die as the incident occurs. Those who are ***dependent*** on medical machines in hospitals will die shortly thereafter. Hospitals have emergency generators, but they will not work for the most part, though some will continue to function, others won't. Remember that most large generators are started using electronics, like computers.

What WILL work? Perhaps as subjective a question as anyone can ask and there's not a firm answer to tell us precisely what to expect. However, any antique radio that has vacuum tubes and no solid state components will work. The problem will be getting power to them as tube equipment takes a lot of power and are generally designed to be plugged into a 120v circuit. Honestly most of this stuff has been thrown away, destroyed or sitting in museums. With the noted exception of ham radio operators and old radio collections it will be difficult at best to find something like this just sitting in the average home in America these days. Most probably cars and trucks without electronic ignitions or requiring computers to start and run will continue to function. Most diesel engines should work as long as they don't contain computerized fuel management systems.

Lest the dear reader think that anything stated here is exaggerated, then we suggest you check out the “Report of the Commission to Assess the Threat to the

United States from Electromagnetic Pulse (EMP) Attack” at
http://www.empcommission.org/docs/A2473-EMP_Commission-7MB.pdf

The best bet for survivalists of course is always to prepare. Collect a couple of old, tube radio sets for instance. You might store more modern items in a “Faraday cage”^[65] (that old broken microwave box is a faraday cage). Get an old metal box, or make one by riveting together some metal sheets, because a good survivalist knows how to do things like this and learns all sort of stupid, un-used skills that no one else would care anything about.

As always, food, water and perhaps weapons are a must.

Next we will look at actual radio “systems” and their uses.

Radio Systems, types, uses

What is a radio system?

Radio systems are more than just “a receiver” or “transmitter”. A “System” is generally consists of a series or set of devices connected together in some manner to do a certain sort of a job. In this case we’re going to consider a “system” to be a radio type and the associated equipment.

For instance the AM radio[66] “system” is all the receivers that can tune up the frequency of the AM band (535-1700 KHz) and the transmitters used on those frequencies in local cities. AM radio is that thing most people won’t listen to any more because it’s full of that awful evil Right Wing Talk Radio. (Heaven forbid we get honest information even though there are those who call it lies!) More important, if you want to know the weather, the traffic report or the news usually on the hour and half hour, you switch over to the AM radio and tune to a local station because frankly unless you’re in a huge city the FM stations only have music and rarely have local hourly information.

Radio stations (both AM[67] and FM[68]) all get their licensing based on “public service”. Most stations do more than just sell advertisements to make money. Many pass on local information about everything from weather, traffic conditions to the prevailing wind directions after a nuclear attack. “Huh? Nuclear attack???” you ask.

Anyone out there reading this remember the “Cuba Missile Crisis”? After that, in 1963 the “EBS” or Emergency Broadcast System[69] was created. It stayed in use until about 1997 when it was replaced by the “Emergency Alert System”[70].

"The Emergency Broadcast System was established to provide the President of the United States with an expeditious method of communicating with the American public in the event of war, threat of war, or grave national crisis." It replaced CONELRAD on August 5, 1963. In later years, it was expanded for use during peacetime emergencies at the state and local levels. Although the system was never used for a national emergency, it was activated more than 20,000 times between 1976 and 1996 to broadcast civil emergency messages and warnings of severe weather hazards. Some dramatic works depicting nuclear warfare (most notably the 1983 made-for-TV film The Day After) included fictionalized scenes of EBS activations. - http://en.wikipedia.org/wiki/Emergency_Broadcast_System

In the case of a National Emergency[71] radio stations will cease all regular programming and stand by for the President to make an announcement. This has never actually been used, but it is in place and can be used to notify the public of incoming missile attack, Yellowstone explosion or the unlikely event of an alien invasion....

This is the AM and FM radio system’s main use, even though it has never been used, only tested or used on a local basis for information about impending hurricanes or other local “doom”. If for some reason an EMP is used this system will never come online and it will be more difficult for those who aren’t aware of what is

happening to find out... what is actually happening. Nowadays you might hear it activated for testing. You will hear a growling-sound, which is actually a digital activation signal, usually three times, then the radio station's programming will be preempted with a "This is a test of the emergency broadcast system..."

Most people switch off the radio about that point and look for the latest song they are interested in hearing.

This is where something called "Shortwave radio"[\[72\]](#) comes into its own. Shortwave signals, by definition are "shorter broadcast radio signals". These signals are higher in frequency (which means shorter in wavelength; this is all mathematics, won't go into that now) than the AM broadcast band, but lower in frequency than the FM broadcast band. They work at the frequencies of 1.6 MHz (1600 KHz) to 30 MHz (30,000 KHz). These radio signals (as well as those in the AM band which is located at 656 KHz to 1700 KHz) are signals that are able to be bounced around in the atmosphere and sent over the horizon. The old timer CBers[\[73\]](#) will remember this phrase as "skip conditions". Hams use this ability too so they can communicate over the horizon. Ham radio operators call this "propagation" (and some of the old ex-CBers call it "Skip Conditions". Old ways die hard...)

Radio signals don't really "skip" or "bounce" off the sky to go over the horizon. They are actually bent by something called the "ionosphere".[\[74\]](#) This is a layer, or more accurately several layers, of ionized gases high in the atmosphere and during different times of the day or night these layers move around and can be found at various heights, affecting radio signals of various frequencies. By definition radio signals travel in a straight line unless something acts upon them to bend them around the curve of the planet.

(Note: Ionization, by definition just means "a charged" gas. Usually, the "ionosphere" contains a load of free electrons stripped from the gases of the atmosphere, and atoms of gasses which are "charged", usually having had electrons stripped from the atoms (or added to them) by way of radiation from the sun and lower atmosphere processes (lightning for instance).)

Thus, any frequency above about 30 Megahertz will not be easily affected by the ionosphere. This is why satellites use frequencies in the very high and ultra-high frequencies ranges.

Shortwave stations exist all over the world, on many frequencies, and in many languages. These stations broadcast talk shows, segments on astronomy, DX listening[\[75\]](#) (the art of listening to distant stations), propaganda, political statements, music and even old-time radio plays or religious shows. You can count on the British Broadcasting Corp. (BBC), Voice of America (VOA), Radio Moscow, Radio Havana Cuba, Radio Netherlands, Radio Canada International and many other stations to provide you time signals, news, propaganda, weather reports and so forth. Most importantly, shortwave stations use the ionosphere, "skip conditions", "propagation", bending, bouncing or whatever you want to call it to its best advantage.

That is, aiming selected broadcast programs at the intended targets.

When your local power goes off and the local stations go dark, grab your hand-cranked, survival radio, string a wire up in the air, attic or along the ceiling of your house (or garage, barn, between two trees, anything to get it outside and up in the air), connect it to the antenna connector and tune around. (Some radios don't have external connectors, just the little telescoping antennas. In that case, wrap your wire antenna around that telescopic antenna or physically attach it, metal to metal). Chances are you will hear someone, somewhere, telling you what is going on in your neck of the woods if no one in your area can tell you.

When the power goes off, the internet will be off, so radio will become your only source of information, and shortwave radio might be the only thing you can pick up in the Aftermath. (Don't ask me why the United States might go dark and say, Chile might not... I can't answer all your questions! But of course it might be the footprint of the EMP!) Of course we hear another shout from the background that "The internet can't fail!"

Actually yes the internet can fail. If the equipment running it fails, the power fails and computers connected to it fail, there will be no Internet. The Internet is only as good as the domain name servers (DNS) keeping track of all that's out there. Attack DNS and everything slows to a crawl. The Chinese and North Koreans are continually mounting attacks on America's domain name servers. Drop a few connections between you and your favorite web site and your favorite website vanishes from the Ethernet. Take out the power to a backbone like AT&T, Sprint or one of the others and a lot of data will just sit there going into the bit bucket. You'll never see it.

Shortwave radio has a plethora of signals. The US military (and other countries' militaries) operates on shortwave in many "modes" from AM to SSB[76] to Morse code (occasionally, almost no military uses Morse code routinely now) to other digital modes (requiring you to know the mode, and have decoding equipment to hear them). There are hourly weather and hurricane broadcasts; you can pick up maritime operations from ship-to-shore to pleasure yachts arranging a berth in their next island stop. You can hear ham radio operators in their own bands (groups of frequencies) talking about this, that and everything else, their radios, microphones, antennas or their pet fish. Sometimes listening to them will teach you more than you thought you might want to know.

It is this author's humble opinion that if you have no other radios you should have a shortwave receiver. A good one will run a couple of hundred bucks in today's dollars. A very nice, very selective radio can run in the thousands of dollars. A survivalist probably doesn't want to spend all his survival cash on a radio though, so go "good" not "expensive" because expensive is not always the best way to go.

You can purchase equipment over the internet (Google "Shortwave radio" and go from there). You can hit Radio Shack (not the best idea, but better than nothing). You can visit a place called "Ham Radio Outlet"[77] either in person to play with the radios or you can connect and shop on the internet, which is still there are we write this article – but might not be next week! Digital is cool. Digital is also very

susceptible to EMP. An analog dial on your radio is better for long term survival, not for you, but for the radio! Our personal recommendation is to locate a local Ham Swap Fest – a monthly or yearly get-together in many cities or states where Hams go to trade or sell old equipment. Old, but working equipment is what you want.

Remember those ancient vacuum tubes[\[78\]](#) we mentioned before? Yep, those old, glass vials in the radio that get hot and make it work? I mentioned EMP, and that tubes are impervious. The Russian military still, in the 21st Century, uses some of that stuff. In fact, the US military has some stashed away to use in the “Aftermath”. Then again, who knows?

If you can find a decent, working shortwave radio – it does NOT have to be a transmitter, and should be what is called a “General Coverage” receiver (a radio that covers all the shortwave bands) using vacuum tubes. If so, it will survive EMP and be useful for collecting information when everything else has gone to Hell in a Hand basket.[\[79\]](#) Of course you will need electrical power for something like this and batteries will work with an inverter, for a short while. But you should probably have a method for generating power from a generator, solar power system (and inverters)[\[80\]](#), wind power or even a modified car with a high voltage alternator.

Storage batteries in the form of lead-acid cells like those found in cars and trucks can be used when wired properly, with an inverter unit. However, inverters contain a lot of solid-state equipment like radios have in them. That means unless it was protected your inverter will likely be useless. We mentioned earlier that solar panels are also not EMP proof. Of course they can be made that way if you plan on operating radios in The Aftermath and you’re probably already putting two and two together trying to think of a way to protect your solar panels. It probably isn’t going to be an easy task, but can be done. Might want to think on that one while you finish reading this book but perhaps a well-grounded metal storage shed, or even an RV sitting there not driving around, could be useful for something?

Up to this point you are probably thinking **“Communications? If we’re in The Aftermath, and there’s no power, people are dying, bad things are happening, nukes falling, there is no way am I going to need this stuff”** and you could be right.

However, we would point out that he who has information has the advantage; or as the phrase goes, “Information is Power”. If you are “in the dark” and don’t know what is going on it will be difficult at best to decide to stay, go, fight or give up. Moving in the wrong direction in an invasion (whether it is Russians, Cubans, Chinese or Extraterrestrials) is a bad idea, and could ultimately be deadly. To somewhat misquote Kofi Annan, he once stated, “Knowledge is power, Information is liberating.” Remember you want information to help you decide what to do. Not having that information could land you in a prisoner of war camp or alien stew pot! Personally, I prefer to be liberated and free than to control things around me over which I cannot extent control! Knowledge becomes power when you’re able to get the information from somewhere and no one else can get that information.

Using radio systems as they are intended is how you collect that data. The AM and FM radios transmitting local information, or Emergency Alert data can and will keep you as informed as anyone else. If local AM and FM are not working, then Shortwave might give you a leg-up when it comes to hearing what the BBC, VOA or Radio Moscow are saying. I don't recommend one source only in any case, listen to everyone. Find out what they are all saying, and use the one, still-working computer, **your brain**, to filter through the propaganda and nonsense. Before you make a decision you need to know the consequences of your tactical (short term goals) and strategic (big picture) moves particularly in a survival situation. Your life and the lives of others may absolutely depend on your ability to weed through the information (or lack thereof) before you make those decisions.

Let us state here that weeding through information is a thinking game. There is no set answer to any scenario.

Many years ago when this author was a teacher the students gave me a lesson in thinking. They would often ask me "what's the answer?" to a test question after the test was over. Most of the tests were multiple choice tests and the "answer" was chosen as the "most correct answer". A lot of these tests contained troubleshooting questions, asking the students to think through some electronic circuit, and work out which part would be bad if you were given certain information.

The fact is, you had to actually understand how transistors, diodes, resistors, capacitors and other discreet electronic components worked to be able to choose the correct answer. Many students continued even after another explanation about the question with "But, what's the right answer".

It took the author a few weeks with one particular class to "get it". One of the students finally explained it. He said, "I want a set of answers, so that if I am trouble shooting a radio, I can look at the list and match the symptoms with the exact components I need to change."

AH HA! The lights came on for this teacher. What the students wanted was a type of a chart they could refer to that would always give them the "right answer" so they could move on to another problem. They didn't want to actually use the information they were learning because, well, thinking was just too difficult!

Thinking IS difficult and we all must understand that part of the problem with our country today (in fact, the whole world) is that thinking is hard! Thinking is hard, doing nothing is easy. Letting someone else take control and direct you where to go is much simpler, and why not? You can sue them if they send you someplace wrong, right? No, wrong!

Thinking with your own, built in personal computer is the only way to be sure of what you're doing. Always counting on others to tell you what to do, where to go, how to do it, how to best accomplish something is the lazy, perhaps even illiterate way to get through life. When you collect information, you are being proactive in helping yourself, exercising that brain of yours and helping others along the way. If you get nothing else from this book, get that. You are responsible for yourself, and you are a

thinking person. Yes it is difficult to do these things but you are going to have to suck it up and do it in a real-world, life threatening, end-of-the-world experience. So you might as well start practicing now.

One other important though less considered “system” is local police, fire, ambulance and public service radio systems like taxis. A simple hand-held scanner can be programmed to pick up most of these. In some areas however, everything has gone “digital trunking” (like my home town of Colorado Springs) where all the police, fire and rescue are on a 900 MHz digital system so that everything is digitized, and doing something called “channel hopping” making it impossible for a regular analog receiver to hear anything, even a static hiss from the transmitters. So, check your local area prior to purchasing scanners for the methods and types of broadcasts signals in your area to help determine what the right sort of equipment to buy. (Again, do your own research for your region, and use your brain!)

Police scanners can be legally used in all states[\[81\]](#) as of this writing (but check your current laws!) and in some cases cannot be used in vehicles or roving around.[\[82\]](#) During “The Aftermath”, who cares? Just be sure, as we pointed out in the beginning, anything you do in normal, daily life, you do legally. Don’t get into trouble for doing something you might not do normally!

In the next chapter we will discuss a bit more about when you can and perhaps should use some kind of communications. We will also look at what “survival” means in definition and what it means to you as a “survivor”.

Antenna Basics

A Glossary for the Radio Communications Uninitiated

So far, we've discussed a lot of general aspects of various communications services. One thing that stands out among the top most important aspects of anything having to do with communications is your antenna.

Without an antenna a radio transmitters and receivers are virtually useless. In fact, a radio without an antenna might as well be used as a paperweight or door stop. With that said, let's look at some real physics for a bit. Don't get wrapped around the axle with the math or physics, but we'd really like for everyone to have a basic, working knowledge of antennas before they go on and do much else. The reason is an antenna can be manufactured from simple wire, and perhaps about anything else that is conductive, including rusty bed-springs, Slinkies (remember those?), copper pipe, metal tubing, and perhaps about anything else that can be cut and/or tuned to a given frequency.

The next few sections will deal with radio antennas specifically. This particular part will be a glossary that will be updated as necessary to contain as much information as possible for you to refer back to when necessary. We will call this a kind of glossary you can refer to when you run into a phrase or a word you don't know or don't understand.

Before we move on though, let's look at some terms and definitions first. Again, don't worry too much about terminology until it becomes critical for you to understand a word I've used. The glossary is here for antennas, at the beginning of the chapter instead of the end so you can read and have a working knowledge of the words if you're completely clueless about how radios do what they do.

Antenna: Any tuned device that can be made to radiate radio frequency energy. The same device can be used to receive signals as well.

Capacitor: An electronic device capable of storing an electric charge. Capacitors are used in everything from power supplies for filtering out noise and cleaning up signals to RF systems for tuning. $\text{--}|\text{--}$ (this is a schematic symbol, the one used for a capacitor.)

Coil: A coil of wire, usually cut to a certain length and wound around a specific sized core, usually air-core, sometimes a soft iron core (called ferrite) which can be used to tune circuits. Many antennas contain coils at the base or in the middle (think CB antennas for instance) and inside your AM radio normally you would find a "loopstick antenna" which is a ferrite rod, with coils wrapped around it, acting as an antenna at medium wave frequencies.

Dipole antenna: Usually a straight, center-fed, one-half wavelength antenna.

Extremely High Frequency (EHF, millimeter wave signals): The band of frequencies from 30 gigahertz to 300 gigahertz, called millimeter wave signals because the wavelength is in the millimeter measurements, instead of meters.

Extremely Low Frequency (ELF): The band of frequencies from 0 to 3 kilohertz. (That is 0 cycles per second to 3000 cycles per second.)

Frequency: An alternating current that appears as a SINE WAVE when plotted out, having a set of valleys and peaks, alternating at a given rate, usually in cycles-per-second. For instance, 60 Hertz (also called 60 cycles per second) has a sine wave that occurs 60 times in one second. A radio frequency is simply a very high frequency, for instance, 150 Mhz, or 150 million Hertz, or 150 million cycles per second.

High Frequency (HF): The band of frequencies in the radio frequency spectrum ranging from approximately 3 Megahertz to 30 megahertz. This area of the spectrum contains a majority of the Amateur Radio (ham) bands, all the shortwave bands, the upper end of the AM band, weather stations, aircraft, ground control stations, and many signals can be heard there. Signals like voice in various modes, digital signals, and facsimile, Radio Teletype, Morse code and others will be heard throughout these frequencies.

Low Frequency (LF): The band of frequencies from 30 kilohertz to 300 kilohertz.

Medium Frequency (MF): Also known as the Medium Wave Band, this is from 300 kilohertz through 3000 kilohertz.

Schematic: A drawing or diagram containing electronic symbols and wiring information for circuits.

Super High Frequency (SHF): The band of frequencies from 3 gigahertz to 30 gigahertz.

Tuned-circuit: A circuit containing a coil and capacitor, also known as inductance and capacitance.

Ultra High Frequency (UHF): The band of frequencies between 300 megahertz to 3000 megahertz.

Very High Frequency (VHF): The band of frequencies between 30 megahertz to 300 megahertz.

Wavelength: This is the physical length of a single (usually radio frequency) sine wave cycle, measured at the zero reference point, to include exactly one cycle. The simple calculation for the wavelength is: $\lambda = C/f$. Where: C= speed of light in either meters-per-second, or miles per second. Your answer will be in either meters or feet. f = frequency in hertz (or cycles per second) and λ (Lambda =) the wavelength of the single cycle. This particular calculation will generally give you the length of wire for a full wavelength antenna and is necessary to know about how much space you will need for an HF antenna or the lower frequencies. The higher you go in frequency, the shorter the wavelength will be.

A nice chart on the spectrum can be found here:

<http://www.ntia.doc.gov/osmhome/allochrt.pdf>

What is an Antenna?

Basic basics: The most basic antenna I can think of is the quarter-wave, vertically polarized whip antenna. You might see these on vehicles for radio communications. You've seen CB antennas on cars, and these are pretty typical of such antennas. The technical name for these antennas is "isotropic radiator". An isotropic antenna is a non-existent, theoretical (perhaps even mythical!) antenna that radiates Omni-directionally (as, say a light bulb, or the sun might). All antennas are "tested" against this format basically and it isn't really necessary you know this, but it might be helpful later if you're building something to understand how to read charts, graphs or other information related to something you're building or using.

There are many types of antennas; most have cool sounding names, and many behave differently than other antennas. Some can and some can't do the job you need done. You will need to understand different antenna configurations for doing things like aiming in a certain direction, getting your signal out in all directions or just getting an antenna set up properly to best receive a particular signal. I'll try to cover some of these aspects over these next few sections, but right now, the title says it all. What is an antenna?

More Advanced Basics: Essentially, an antenna is very simply an electrical element (a wire) in a radio circuit that can pick up the desired radio frequency signal and deliver it to the radio circuitry. That's the simple explanation.

The difficult explanation is that it is a wire that is "excited" by the passing of an electromagnetic waveform, which in turn induces current into the wire. That current is then fed to a circuit to be used in some way, usually by tuning the desired signal, detecting the intelligence in the radio signal, amplifying the detected audio and then feeding it to a transducer. Transducer is another name for a speaker, headphone or microphone.

Let's see here. Electromagnetic signals consist of basically, an electrostatic field flowing away from a 'radiator' (radiator is another name for an antenna!) combined with a magnetic field that is at "right angles" to the electrostatic field. The two components of the EM field are required for the signal to become a "radio wave", or dissipated Radio Frequency (RF) energy. We will not worry about things like how the signal is generated, but will concentrate on the simple reception of signals, and assume we're not going to build a whole transmitter at this time. At another place in this book we will discuss a simple radio receiver that can be built from common parts you can find around your home.

In physics, if you have a piece of wire that is just a large loop, and the ends of the wire are attached to a volt meter (a device to read voltages, obviously) and you take a magnet and point one pole of the magnet at the wire and hold it there, nothing will happen. However, if you move that magnet back and forth across the wire, you will cause the magnetic lines of force from the magnet to cut back and forth across the wire. In so doing, you will force what we call the "induction of current" into the wire, which can then be measured by the meter.

This is the very basic premise for how radio waves are collected by an antenna (and also how electricity is generated in alternators and generators). The RF energy

traveling around, passes over a wire (the antenna), and induces a current into the wire. Of course, in physics/electronics you have to have a “complete circuit” as well for current to flow, and this means you need a “load” (simply a resistance into which the current will be dissipated as heat energy usually – but we’re going to make it do something else), you need a path and you need to obviously have an energy source.

For a radio receiver you have an antenna, you have a complete path, which will take the induced current to “ground” and you have a load, which in the case of a receiver will be a “tuned circuit” (a coil and capacitor) which will act as the load. (Technically, this is an INDUCTIVE load, because there is a coil.) This “load” is the radio receiver itself.

You need two more things to make a radio receiver besides the antenna and a tuned circuit. You need a DETECTOR (which in our simple radio will be a diode, a device which passes current in ONLY ONE DIRECTION) and you need a transducer, which as I explained elsewhere is a simple high impedance earphone or headset. If you can locate an old, old telephone, circa 1940-1980ish with a regular hand set (not the newer, fancier stuff) you can usually unscrew the ear phone portion and take out the little earphone piece and use it as an earphone. It is a “high impedance earphone” and a single one is all you need.

I’ll teach you a bit about building a simple radio receiver later, so collect some parts if you can when I mention these things.

Now, let’s talk about Medium Wave (or Medium Wavelength) and the AM band for a while, since everyone is familiar with it and the simplest radio receiver you can build and make work will be for that particular band. The AM band frequency range falls around 535-1600 kilohertz (KHz) and is probably one of the oldest “bands” of frequencies that has been used in the one hundred-plus year history of radio. Marconi’s famous “first transmission” across the Atlantic was at 500 KHz, and was accomplished using a device called a spark-gap transmitter. Its output power was in the 35 kilowatt range (35,000 watts), but probably had peak power outputs in the tens of MEGAWATTS range. The intelligence consisted of three “dits” (the dots in Morse code). The signal was picked up by a simple receiving device in what is now Canada at a distance of roughly 1550 miles, and the signal had to have bounced off the ionosphere twice.

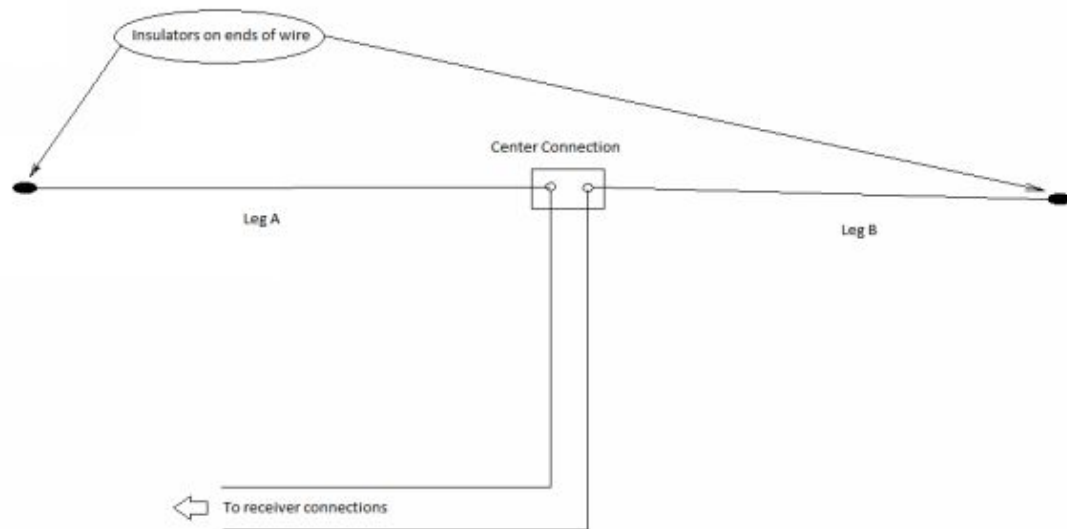
Amazingly, one doesn’t need megawatts to broadcast across the ocean. I’ve had CW QSOs (Morse code conversations) with people in Japan, France, Germany and several other countries, as well as within the United States using a battery powered, QRP (low power--fewer than 5 watts) radio. The secret was my antenna, which is what this is all about.

The AM band has a wavelength running from about 560 meters down to 187.5 meters. What I just told you was “math” (Yes, yes, math, why does this have to be so difficult, you ask). Actually, this is pretty simple.

Basically, the formula was given in the previous message. $\text{Length} = C/f$ where C is the speed of light, and f is the frequency in Hertz. The answer (Length, usually showed as the Greek Lambda in normal formulas) is the WAVELENGTH in meters. $C = 300,000,000$, or 300 million meters per second, that’s the speed of light. 535 kilohertz is 530,000 hertz. Simply divide the F into the C and your answer is in meters. You can convert meters to feet, yards or inches, whatever is convenient for your use.

Now, 560 meters is actually, well, pretty long. It is roughly 1690 feet or so. Most people do not have back yards that big, especially if you live in a city. This is where some thinking comes in. In antennas, there are divisions of the wavelength that will work well with antennas. In other words, you could divide this number several times by multiples of two, and get a working long-wire antenna, or better a dipole antenna. Here's a diagram.

Here is a working model (OK, it is picture of something that would work):



What you're looking at is ANY antenna for ANY radio on ANY frequency, as long as it is cut to the right length (or approximate length). The truth is, if there are signals out there, ANY antenna will work; some will just work better than others. The two legs (Leg A and Leg B) would be measured out for the frequency you're using. This isn't too critical for receivers, but very important if you're going to be transmitting. The receiver connection end will have one wire going to an antenna connection on the back of the radio, and the other to a ground connection on the radio chassis. Note that some radios do not have antenna connections and only one of those telescopic antennas. You could connect one of the wires directly to the telescoping antenna, and the other to a screw that is part of the grounding system inside the radio. Better radios will have a connector, or screw terminals of so sort on the back of the rig. (Rig is what we hams call a radio, it's slang.... for radio.)

You could construct an antenna out of either thin or thick wire. You can use about anything that insulates as insulators. I've used old pill bottles, and nice, glazed ceramic insulators made for just such a thing. The center connection is used simple to connect the legs to something, should be strong enough to support the weight of the antenna wire. The insulators on the end will have rope, string or some other sort of line to attach to distant objects (trees, poles, house, barn, whatever).

Baluns are transformers, and should be built for transmitters, and better antennas have them, and if you're going to get the most out of a specialized antenna it is best to learn more about this... but we don't have the space for that here. It is used to match the impedance (the internal resistance, inductive, capacitive and resistive – known together as reactance – which using some formulas give you something called impedance – never mind, its math again). Simply, we can ignore the balun for most purposes right now. A balun would be mounted in the center instead of the center connection points. Balun means “Balanced-to-unbalanced”. Two wires like shown above are balanced lines. Coax (aka coaxial) cables are unbalanced wires.

When to use survival communications

Survival

Before we delve into the “when” part, let’s define some things. Probably if you’re reading this paper you’re possibly the kind of person who has already considered the “What If” of nuclear war, exploding super volcanoes or alien invasions. So you might already consider yourself a “survivalist” or you might not want to be associated with the word or at least not let on to your friends who might think you a kook... (And who wouldn’t with you collecting all those beans and rice, filling up every bottle, jar and tub in your home with water, finding old tube radios and digging a fallout shelter?)

Seriously though, what precisely IS a “survivalist”?

By definition, a survivalist is as follows, thanks to “The Free Dictionary”:

sur·viv·al·ist (sə-r-vī-vē-lĭst)

n. One who has personal or group survival as a primary goal in the face of difficulty, opposition, and especially the threat of natural catastrophe, nuclear war, or societal collapse.

Essentially to be a survivor is to be the one left alive after a disaster, accident or some other event that might have taken the lives of others around you, or yourself unless you got lucky or did something to prevent dying. A survivor usually is that lucky guy or gal who avoided going too far out on the ice and fell through to their ankles instead of to their chests. The survivor is the person who, under the circumstances walks away from something that no one should have otherwise walked away in one piece (or at least not as injured as others). Survivors find themselves in those situations without helping the circumstances along and simply say “Whoa! What happened? Man, was I lucky!”

In other words, most survivors didn’t plan to survive, they didn’t expect to be in an accident or disaster, never thought it would happen to them, or thought “It can’t happen here,” and yet, the unthinkable or (more accurately the) un-thought-of occurred. Those folks are the ones we call “Lucky”.

Luck is something you collect, not something you stand around waiting to happen to you. If you don’t believe this then look at it this way, let’s pretend there is a big cosmic box out there with your name on it. That box starts completely empty when you’re born and remains that way until you achieve your own self-consciousness. At that point the box is still empty but you are a thinking person now and you can learn from your mistakes so as not to do those mistakes again. Each time you make a mistake and survive the mistake a little Luck Chit is placed in the box for you. If you learn something new about how not to endanger yourself, more chits are put in the box.

When you take the steps to ensure your personal safety by checking the brake fluid in the car, or learning how to swim, learning to build a fire, even more Luck Chits are put in that box by the cosmos (or someone...).

When the box has enough chits and something bad happens around you, some of those luck chits are used up – and you survive!

Well, not really....This is really how luck works; you make it yourself. It's not a random event that leaves you alive, there's no box of lucky tickets, it's your own ability to think and act in situations that would otherwise kill you. Those who we call lucky sometimes (usually never) have bothered to study anything, don't know about avoiding grizzly bears, and don't have super powers in a plane crash. They just "survive" and they add a chit to their box, but we hear about them and we learn a lesson too. Don't get on the big plane; don't eat candy when hiking in grizzly country and study things to help you stay alive like martial arts (Krav Maga, anyone?)[83], shooting straight and knowing how to purify water.

You are not the lucky one, or the one who doesn't expect it to not happen. No, instead you are the person who expects the unexpected, plans for the worst, hopes for the best and prepares for the worst with a weapon in your hand if necessary, food in your backpack, a backup plan, a place to bug out to, family members taught and prepared to be beside you and willing to do what it takes to stay alive in the worst of situations. It is those folks to whom this book is directed, the true survivalists. Those people who have thought things through, know the score and have the ability to use their God Given talents, skills and abilities (learned or otherwise) to extricate themselves from any and perhaps all situations requiring a modicum of preparation, commonsense or thoughtfulness. Whether they realize it or not, call themselves by a particular name like "survivalist", they ARE the survivalists.

In normal, everyday circumstances getting into a "survival situation" isn't as easy as you think, but it certainly happens. The first thing any survivalists will tell you is not to be there when the situation occurs. The first thing any survivor (as the above survivors) will tell you is "I never expected that to happen!" When the truth is told, they probably never once considered what would happen to them if they weren't paying attention to their surroundings (situational awareness). The next thing a "survivor" will tell you is, "I won't do that again!"

Situational Awareness

Speaking of Situational Awareness^[84], let's discuss that for a moment and consider what it means to you and to others. If you are walking down the street looking at your map, trying to figure out which street you're on, where you are headed and how far you need to go and you somehow miss those three, large, burly guys wearing chains, brass knuckles and sunglasses at night, you're perhaps not the most situationally-aware individual on the planet. In fact, just about the time they pound your head into the pavement and kick you in the groin, taking your wallet AND your stupid map, you will probably realize you made a mistake.

On the other hand if you've planned your route ahead of time, left the map in your pocket, and went during daylight hours to the place you're trying to get to in the first place you might have an advantage on the three leather and chain clad individuals because frankly, they are probably still sleeping because it's not time for them to go out to party. In fact, knowing exactly what is going on around you and then being able to actively change your movements, thoughts and even ideas of what you're going to do in the next minute or two is likely to keep you alive in pretty much any circumstance.

We say this because 1) you won't step into the street in front of the bus without noticing the bus, 2) you won't be going out in a bad neighborhood after dark, 3) you will be looking up and around and you will know who is around you, what they are doing and if they are "dangerous" appearing to begin with. In short, being aware lets you actively consider everything happening, moment by moment and judge the consequences (even unconsciously) of making a misstep.

As an experiment, when you have some time to kill, go sit in a mall or stand around on a busy street corner and try to be inconspicuous. Now watch, and look carefully at the people around you and what they are doing. Note how the ladies are standing, what they are doing and what they are holding (Don't do this in front of your wife or significant other; they tend to frown on men staring at other women; and don't stare anyway, as that's conspicuous! And if you're a woman your husband might question your motives as well....) Are the women holding a purse? How are they holding it? Is it secured or could a purse snatcher run up and grab their purse and get away?

Look at men and how they "carry themselves". Some men are certainly the "macho" type and if they catch you "staring" might glare back, or worse. (Try not to let other men catch you staring. They or their wives might take offense, or as an invitation!) Those that look back are probably aware of what is happening around them. Some men might be more... shall we say timid. They look down, around, up and about rather furtively, won't look at you and avoid your gaze. They lack confidence and won't make eye contact with anyone, at any time. Not that making eye contact is necessarily a good thing but you should be able to do so without wetting your pants.

There are men who are busy with their friends, talking, laughing and pretty much ignoring everything except the sound of their own voice. They probably don't even notice you there because you are, frankly, beneath their notice. You are insignificant and you are not a threat to them, even though you might be a threat if you were planning to make them your next victim. If you were a threat, they still probably wouldn't notice your presence until it was too late for them. Pretend you are the criminal. Think like one, but don't make it obvious of course. Pretend you are the purse snatcher, the robber, the highwayman. What would YOU do to get over on your victims and get away alive and free?

This is how you begin to "get into the head" of the criminals and understand, or at least begin to understand how they think when they are scoping out a target.

Now, look at yourself. Consider your own actions while walking through a crowded mall or crowded city street in a large urban area. How do you act? How do you carry yourself? Are you confident? Do you know where you are, where you are going and have no outward appearance of being timid? Good. If not, go home and change your underwear after you wet yourself when someone catches your eye; understand you might need to work on this "attitude" before the world disintegrates because this is part of the "Survivalist Mentality".

Having a positive mental attitude is the number one thing you can do right now, today, and keep that attitude each and every day. This is the mentality you must have, whether you have it instinctively or you have brainwashed yourself into believing in yourself, you must have the will to survive in any circumstance be it an unwarranted attack by a thug, leaping out of the way of an out of control vehicle, clawing your way to the surface and getting out of a lake you accidentally fell into, or holding on long enough to the edge of the cliff to pull yourself to safety. If you don't have that attitude, that ability, or the ability to make yourself believe in yourself, you're not going to be a "survivor". You will, however, become a statistic.

You would be considered a "Survivalist Wannabe". No one wants to be a wannabe. They want to **be**. So do you, you want to survive whatever comes your way, and you will if you believe you will. Your whole attitude can make or break your chances for surviving any situation that puts you in danger. If you panic easily, you will need to work on this problem and deal with it. Eventually you can keep yourself calm. It's beyond the scope of this document to explain how, but it can be accomplished.

Remember it's not being arrogant to believe in your own abilities. Being positive in all you are doing is helpful. So is keeping busy when you're standing in the woods in snow to your ankles with it still coming down, few clothes and a not-very-good idea of where the hell you are or which way to go. Sometimes simply staying put and working towards staying alive is the only thing you can do. In fact it IS the only thing you should do in that situation!

As a matter of fact if you have a phone, radio or something else with which to communicate, THAT is the time to use it. Not when you're too weak to move and think

clearly, it's too cold and snow too deep to move or your cellphone battery has died. If you contacted someone, then making a shelter for the night might be your one, sure way of being there tomorrow, whereas walking off in that light jacket in the direction you THINK you left the car might mean your certain and utter demise. Thinking good thoughts about getting home tomorrow, while building that lean-to with your pocket knife (you were carrying one on your day hike, right?) will do wonders for keeping you going. Collecting some of that snow in your water bottle to melt later will give you some water. Stuffing old leaves into that thin jacket will warm you up a bit. Finally, remembering you just happen to have the skills learned as a Cub Scout to start a small, warming fire will get you through the night. Food shouldn't be your first, second or even third consideration in such a situation. Surviving should be the first thing, not getting back home or to the car. Shelter (especially in a bad weather situation) is probably your most important consideration. Water would be next and then food. Getting out is going to be the next thing to accomplish, but only after you've ensured your safety (and/or the safety of your group).

Remember this: Most people die of exposure when in bad situations. In bad weather, with hypothermia setting in, you can die in 30 minutes to three hours. So first, find shelter (and fire if you can). Next is water, as without it you can die in as little as three days. Without food you can survive three weeks, but probably not much longer.

Common sense thinking is always needed, no matter how much book-learning you have under your belt, and actually putting into practice those things you have learned in the past will reinforce your knowledge. In fact, those of you who consider yourselves to be "survivalists" might want to re-examine how well you can start a fire in a very bad situation. That is, you haven't any way in your hands to do it, and you are standing in the woods, alone, and it's getting cold and dark and you lost your backpack a few hours ago in the river, along with your canoe, and left shoe... now what do you do to get warm? Worst case scenarios, consider them!

Let's consider for a minute the original scenario way back at the beginning. You know the slow buildup of hostilities that eventually results in the instant loss of nearly every electronic and electrical piece of equipment in two-thirds of the USA (by the way, we haven't considered the probability that if ONE EMP went off, several more did too and took out Canada, the rest of the US, most of Mexico, pretty much all the satellites above your head and your digital wrist watch. Don't laugh, it could happen!) So here we are in downtown crowded Anycity and the traffic lights suddenly blink out. Cars, trucks, and any other vehicles with few exceptions (some diesels and engines without electronic ignitions for instance, motorcycles and bicycles) stop moving. People talking on their phones stop, pause, look at their devices, look around and try re-dialing whomever they were talking to.

You glance down and see your digital watch is dead. Having studied and learned, you realize pretty quickly, well before most, what has happened. What the hell are you going to do? You don't have a working cell phone, you're thirty miles from your suburban home and you're on foot because you know that car of yours is not

going to start. Situational awareness becomes your absolute, number one, best friend right now. You have to get yourself out of this city, out of the surrounding area and it is about five hours before the sun starts setting. You'd better move and quickly. It's going to take you quite a few hours to get home.

If you're in good shape, you can walk roughly 3 miles an hour. That's ten hours from home. It's going to be a LONG evening, and you have no way to contact your wife/significant other. The cell phone system is dead. What about a radio? What about the one in your vehicle?

Well, chances are good if it was EMP your electronics are fried. But you, being the good, thinking survivalist you are have a handheld radio stashed in a metal box inside your trunk, which has a good battery (because you just happened to have checked it this morning because you're anal retentive about everything too....) so you head straight to the parking garage carefully avoiding the security people who are milling about outside now trying to figure out why nothing is working, dash up the stairs (no elevator, remember?) and get to the floor where your vehicle is located. Trying the key fob tells you the worst of your fears; the door doesn't unlock so you use the (gasp!) key to do so, and try to start the engine.

The tiny chip in your key and your car won't talk to each other, and the car turns over and over, but doesn't start. Electronic ignition and security keys... you curse under your breath. Opening the trunk you find your back pack with food, water and radio – oh, and that handgun you just happen to carry in that bug out bag. You are on the 8th floor of a parking garage and there are two more stories up to the top. There are some other tall buildings but “Anycity” isn't New York, so there's no other one-hundred-plus story high rises in the way.

You figure if you go to the top and put your radio (it's a hand held unit) on high power (probably 5-8 watts) and hope your wife/significant other is aware of the power outage and that she will have turned her radio on as well. You can possibly get her a message. You decide to try. You figure you have 5 hours and 30 minutes until darkness falls, since it is dead summer time, you're in the Midwest and there are no mountains to block the sunset.

Jogging up the several more flights of concrete stairs you pass people talking quietly about what might be happening. It is starting to dawn on some of them this isn't a regular power outage because phones aren't working either.

At the top you call your wife's call sign. Twice more you try with no response. Just as you're about to shut off the radio (to conserve your now very precious battery life) you hear her voice, weak and distant responding. Thirty miles! You give her your sit-rep (situation report) and tell her you are making your way back home on foot, you will see her in 10 or 11 hours, sooner if you can find a bicycle or a skateboard. She signs off after you say you will try to contact her again two hours from now and again two hours later, on the hour. You figure you might be able to hear her, or she you, but you're not 100% sure. But you will try every two hours anyway.

Jogging down the stairs you reach the bottom, head down the main and rather crowded street in the general direction of your home. You decide to stick to main roads, the freeway itself because there aren't any moving vehicles down there. In the distance you can make out dozens and dozens of people milling about the road way. Some are walking and some are standing about doing nothing in particular. You decide not to interact with any of them, move quickly and ignore calls from other people. Time was once when you would talk to anyone, but today is not that day, and not tomorrow either. It's time to go.

You continue your jogging and move rapidly out of town. In an hour you figure it's time to just walk fast. You only have a liter of water and a couple of snack bars in your pack and you're not in the same shape you used to be. Jogging was never really one of your favorite activities and today it's warm – hot in fact and you're sweating a lot. So far though, nothing else has happened. A few people called out to you to ask if you knew what was happening, but since you are moving down the freeway side road now no one bothers you. Soon you notice some are even walking now. Mostly those moving are not moving very fast, but a few, like you are in a decidedly hurried gait. A few have backpacks too so you decide they are "informed".

Eventually one, moving more quickly than you now catches up and strikes up a conversation.

He says he thinks this is the big one, you agree. He wishes you well and turns off at the next road and heads east, you continue south. Darkness falls and things become eerily quiet. No one is on the road now except you and you're in a big hurry. Ahead you see a fire on the road, and six or seven people standing around chatting. They are a mixture of males and females, all dressed in various types of clothing, mostly jeans, some women are in high heels and a couple of men in suits, with their jackets off and ties hanging loosely now. They appear harmless.

They wave at you as you pass. One asks if everything in the city is dead, you respond that even your wrist watch has died. They mutter among themselves but leave you alone. Finally a couple of hours away from your home, much later that night you call again on your radio hoping you're calling at the right time. You are simply guessing how much time has passed but suddenly your wife's voice is there. She assures you things are "ok" at home and to hurry there. You do. Eleven hours later, you make it home, sore, tired, thirsty and hungry.

You have successfully survived the "First Day" of the Aftermath. The rest of the people haven't quite "got it" yet. You dig into the basement boxes and pull out of a metal box, your crank-generator shortwave radio and start turning the handle to charge the battery. With candles and a couple of kerosene lanterns burning in the house, you ask your wife to close windows, doors and curtains to make yourselves a smaller footprint on the face of the planet.

The BBC is on the air. They are reporting a massive EMP, with perhaps more than one weapon, over the United States, Canada and Mexico. The world believes

the Russians are responsible, but every terrorist group on the planet is claiming victory over "The Great Satan".

"America is screwed" is your thought before preparing for tomorrow which is probably not going to be as good a day as today was. Today you were a survivalist. Tomorrow you plan to be one of the Survivors.

In the above "example" story we found our hero, you or perhaps your alter ego caught in a bad place at a bad time. But it might have been worse. You might have been trapped in the city. It might have been three or four days down the road when everyone had figured out that the world as they knew it was coming apart at the seams. By then there will be the gangs roaming and doing what they want without much police intervention. By then there will be the rapists roaming around doing what they wanted to do with impunity. On that part of The Aftermath there might even be armed invasions in parts of the country since this was all precipitated by an armed conflict in some other part of the world. By three or four days, society will be breaking down as people start dying from lack of medication, the oppressive heat of the summer kills old and young because there's no longer air conditioning, hospitals will have become overrun with everything from blisters (from walking so far in bad shoes) to heat exhaustion and heat stroke, stabbings and bullet wounds.

Police officers that were evident in the first days will be leaving for their own homes to help their own families. Government personnel will be abandoning – or being told to leave their posts and go home as well. Businesses will have shut down completely, since vehicles can't move, nothing is being delivered. Food in trucks on the sides of highways will have already been looted, as have all of the supermarkets, mom-and-pop markets, malls, corner 7-11, gas stations and random houses and businesses. Anyone in the city who hasn't looted or stored food will be in trouble in another week.

Those who stored food will be looted if not well armed. Those who are well armed will become the looters to keep themselves, friends or families alive. Gangs have already started forming and growing in number. They have begun arming themselves with anything they can, from chains to sticks and stones to the random gun they have, or have taken from some other victim.

Places that had solar panels in obvious display like roadway signs, buildings and commercial buildings have been robbed of anything looters can get their hands on, including the solar panels, batteries, gas from underground gas tanks (Assuming the looters can figure out how to pump it out of course) and many vehicles along the roadways have already been broken into unless they were occupied by people. The gas tanks have been emptied in long stretches of the roadway, the looters using it for fuel to start fires. (In fact, remember gas in a survival situation!)

Speaking of fires, buildings are randomly burning in Downtown Anytown now and many of them are nothing short of hellfire infernos. No one is there to put out the fires, and who knows how or why they started?

We believe that if the National grid shuts down (regardless of the reason, whether solar storms, EMP, deliberate nuclear attack or even that darned Alien Invasion) that America has perhaps three or four days before nearly total societal breakdown[\[85\]](#) occurs. Again, you might pooh-pooh this and say, “We will survive, we always have, we always will” like so many others believe. This author believes we will survive too... but individually.

America itself is a country, an idea, and an ideal. We’re here because of the Constitution, not in spite of it. However, you just have to look at day to day happenings in any city, large or small to see the crime, stupidity and hatefulness that originate in any urban area. Humans are helpful most of the time to one another and in the short run they will come through for one-another. At some point through when people are put in a position of having to find food, no way to communicate with the rest of the world, lose their computers, Facebook and iPhones you can bet some of them are going to be pissed off and probably take it out on others especially that one “friend” who kept blocking them on Facebook... but I digress.

The interesting thing about this thinking exercise is that there is plenty of evidence for Societal Collapse. Rome fell, though some believe it took a couple of centuries. The Soviet Union fell and took only a few months to disintegrate.[\[86\]](#) The truth is no one really knows, or even begins to understand what can cause the collapse of an entire civilization, let alone a county or a society, but with very little effort one can certainly imagine that the United States is a country and society hanging on to itself through a system of systems. That is, everything is at some point dependent upon something else. When one system fails, say, the power grid, then hospitals, transportation and food storage centers will fail. If communications systems fail, such as the Internet, it might affect the people in a cursory manner because we can no longer get to Facebook or play some online game; however, it will affect us more through banking, money management, the Stock Markets and payments of bills, lack of news and so forth.

More to the point, electronics keep computers going. Computers power everything from GPS to Airplanes to Trains to the Stock Market, to banking, bill paying, power grids and your microwave. Even if the power doesn’t go out, computers hit by EMP are going to be useless and all those other systems will start to fall apart, perhaps slower but they will fall apart.

In a collapse those that already skirt the law, or tend to hang with the “rough crowd” already have a mindset that will send them rapidly into the “join the gang or die” mentality. Gangs will start to take over the cities because many cops won’t stay on the job when society is sure to break down in a few days. We’re not faulting the police for this, because they are human just like the rest of us and we sure wouldn’t hang around some place we’re not wanted when lawlessness becomes the norm. It won’t happen immediately, but eventually the criminals will outnumber the lawful. The lawless will be outgunning the law and it won’t matter which side you’re on, you’re going to wind up a target in a few days by one side or the other.

The “Haves” will be targeted by the “Have Nots” and soon enough there will be lines drawn. In a week or ten days there will be enough chaos that many will be trying to form groups, coalitions or safe zones. In a week many American communities will begin to pull together and set up neighborhood watch “programs”, impromptu systems of guarding the area against looters. Looters will be shot on sight as will non-looters who happen to be passing through. Area fights will begin, and end with blood shed. (Note: The author has discussed this with several neighbors in his own area. We actually have a vague plan in place if something like this happens. Most of the neighbors are more of the “follower” type, rather than “leader” type, but most will go along with the plan. A few were ambivalent about it. A few more were openly hostile to the idea of anyone doing anything without “government assistance” or “permission of the police”. We won’t count on them to be anything but problem children.)

In two weeks hundreds if not thousands will have died from street fighting, robberies, out-and-out revenge murders, rapes and who-knows-what else. Much of it won’t happen on your own street, at least not right away, but much will happen very nearby perhaps two or three blocks over, more or less. Your own area will be on constant alert and under guard of the guys with the guns in your neighborhood. It won’t matter because some stories from “outside” will be true, some will be embellished stories and some will be outright lies or deceit and there will be times it will be impossible to know the difference.

Let’s go back to our example story for a few moments.

You and your wife haven’t left because you decided to hunker down, as you live 30 miles out in the suburbs, away from the center of the city. The little radio you have hidden in the basement tells you at night, via the BBC that American forces are battling Russians at many landing spots along the US coast lines. Chinese forces appear to have joined in. You are far enough inland that you won’t be bothered for a time, but it appears Americans are taking up arms all along the coast and fighting the invaders. Then you hear Washington, DC was nuked last night. The President is probably dead. No one knows who is in charge at this point and the United Kingdom has chosen to remain out of this conflict because Russia threatened their tiny country with nuclear obliteration. There will be no cry of “The British are coming” this time around – however mixed the metaphor. In fact, those few NATO countries that were helping the US a few weeks ago have stood down and are waiting to see what happens. No one wants to cause a “World War” although the world is in the full and bloody throes of one.

The US finds itself and its people alone against the two largest communist nations on the planet, and no one is sure if Cuba, Venezuela and North Korea aren’t involved too, not to mention most of the Muslim-associated countries of the world. Israel seems to have come to the aid of the United States, but they have their own hands full with an all-out invasion from Syria, Egypt and Iran. There is word that Taiwan has been invaded by China and US Forces were nuked again in that region, probably by the Chinese, but information is sketchy.

You pass on what information you've learned from your shortwave radio to the "Group Captain", some guy up the street who had a bigger gun than everyone else and was "elected" by the other people on the block. He tells you he wants your radio as soon as you can get it to him. You argue at first, but he is adamant about "helping the group". At one point he aims his weapon at you and demands you go get it. That was his first and last mistake. You agree and go get the radio. When you come back you have your sidearm on and when you hand him the rig, with your left hand, you pull your weapon with your right hand. He didn't have a chance as he had his rifle slung on his shoulder and wasn't expecting a fight. You shoot him three times, twice in the chest and once in the head when he reaches for his rifle. No one else says a word to you; no one pulls out a gun to stop you. A few nod to you as you walk off. The world has changed drastically from two weeks ago. Life is never going to be what it was.

Since your food is nearly gone, you and your wife decide to "bug out". You pack up some back packs, arm yourselves and grab a wagon, the only thing on wheels you can haul things in and you leave the area late at night, taking a back route out to a main road where you know you will not be hassled and head for parts unknown, and out of here. Nowhere you go will be any better, or any worse, but at least you won't be in that neighborhood anymore.

Our purpose here was to give some examples of honest survival situations without all the accidents, non-thinking and total luck that goes into "becoming a survivor". Instead of painting the luck, accidents and bad thinking that normally happens, our character here is a person who has considered all the things that might happen and has taken seriously the fact that others won't be trained, won't care or just don't believe in "what can't happen". This survivor is now a survivor because he chose to be, not because he was ordained by luck, God, nature or by accident. Instead, he made sure he wasn't in the wrong place at the wrong time, and left when he had too. He might have stayed. He might have left earlier. He just wasn't sure though, and after having to kill someone who was bullying him, he decided it better to go rather than remain here in this area.

His use of "Survival Communications in the Aftermath" accomplished two things for him. It comforted his wife to know he was alive and well and on the way home, and him that she was safe. The second thing it did for him was to receive and use the information to know what was happening in the world, which countries were at war, where they were fighting, and why.

When he shared his data with others one of them became jealous of his ability to know something the other didn't. This resulted in the death of a neighbor who became a bully. It didn't have to happen and might not have if our hero had simply given up his radio to the "elected leader". Our "hero" instead chose to Un-Elect that leader and left the group rather than deal with other, perhaps worse ramifications later. Don't think this couldn't happen? Guess again.

Remember that "Information is Power" in more ways than one and in this case the Leader felt his power being usurped by some guy who happened to have a shortwave radio that no one else had thought to own for themselves, including the

Defacto Leader. We're not here to judge any of these folks (indeed they are simply invented characters for our own diabolic purposes, that is to say, lessons...). So whether our "hero" was right or wrong, or the "Leader" was right or wrong is for you to judge. When next we meet our "hero" we will see when you should not be using radio communications in a survival/aftermath situation.

When NOT to use survival communications

Or Why you shouldn't use radio communications sometimes.

When should you not use communications? When it will get you killed, to be very precise. You shouldn't use radio communications when it will give away what your group is doing, how they do it, your location to an enemy. You should not telegraph your plans, your routes, your unit size (or number in your party/family/group) and you absolutely never should give anyone information that will put you into a position that will cause your demise.

There are two phrases you should understand. Communications Security and Operations Security; COMSEC and OPSEC for short. We will break these two things down more clearly later on.

Opsec is the process of protecting your entire group or organization by preventing an enemy or adversary from getting intelligence about you without working hard for it. If you give away your guard movements over the radio, they've pretty much "got you". Opsec is really more of the process of identifying the little pieces of data and information, that when put together gives that adversary a "big picture" of your operations.

Comsec is more of a discipline than a process. Basically you train your people to use code phrases for things to prevent the enemy from getting locations, or other information. In the United States, it isn't legal for Citizen Joe Average to use encryption on most of the radio services. Amateur Radio is one of those. CB is another. FRS and GMRS are another. Thus using plain language is required in normal times. In the Aftermath, anything goes. Encryption is one way to prevent the unauthorized "hearing" of messages.

The other is to simply NOT transmit information over the radio you don't wish anyone other than the receiver to know. Thus, you shouldn't use radio communications when you need to remain secret, hidden away or don't want anyone to find you. You shouldn't use radio communications when you can be triangulated. You should never use radio communications in a situation that will label you as a "Gold Mine" – someone with a lot of "stuff", because the bad guys will come find you.

If you're in a situation where your communications might be monitored (and that might be at any time) and the information can be used against you, the advice of a lawyer would probably be, "Don't do that". For that matter even in a normal, everyday situation, if you use a cell phone, text messaging or even send an email or make a forum post somewhere that might indicate something "illegal" or leaning to "shady" it's not a good idea to do that anyway.

How many times have you heard of the authorities reading someone's text messages (or finding statements on Facebook) after-the-fact and a jury finding them guilty based solely upon the dumb things the suspect said? We've probably heard it

enough to know that anyone with a lick of common sense shouldn't engage in self-incrimination. Let the state prove you did something wrong, don't hand it to them on a golden platter for goodness sake!

Triangulation

That said; let's get something clear about radio signals. They can be traced by something called triangulation.

A simple method of triangulation can be used for radio signals that anyone can test to prove it works. In fact, I'm going to show you how to find a radio signal. First we will need for this experiment a simple – the simpler the better – portable AM transistor radio. They are little cheap radios and you can probably still find them at Radio Shack. They don't have to be expensive, in fact, the cheaper they are the better. Free is even better, so check with Grandpa or Great Grandpa to see if he still listens to his favorite baseball team with a little earphone and transistor radio.

If you look inside a small transistor radio you should find a small, black chunk of iron with some wire wrapped around it. This is what is called a "loop stick antenna". The chunk of iron is very soft iron filings held together with glue and is the core of the antenna (the ferrite rod mentioned at the beginning of the Antenna chapter). The "loop" part is the coil of wire wrapped around the core. This radio is highly directional in the direction off the sides of the antenna. The ends are much less directional meaning that the ends are the least responsive to radio signals.

Open the radio up (usually taking the back cover off) will allow you to see the part we're discussing. Place a (usually) 9 volt battery in the device, close the case back up and turn it on. Now tune in a middling strong signal or a very weak signal. Now if you hold the radio vertically (orient the internal antenna horizontal to the ground) and slowly turn it, you will hear a point where the signal (audio) gets pretty loud. At another point it will fade away, and perhaps completely go away. You will probably have to experiment a bit with various stations to see which ones work the best in this case, but the principle remains the same no matter what frequency band you are using. What you have just shown is that the antenna is "directional" and you can use it, a map, compass, pencil and a ruler to locate that radio station.

To find that station requires you move around. We'll get back to this in a moment, but put on your walking shoes.

Take your map and locate yourself on the map, you're probably at home, so make a dot on the map where you are. Orient your map so that it is showing your street outside and on the map in the same direction. (If you don't know what I am talking about perhaps you should take a quick course of "orienteering" - a very good survival skill!)

Now using the radio, figure out which direction the strongest signal is and at your position draw a line in **both** directions through your location through the dot you already drew. Remember that the strongest signal comes from the long side of the antenna (NOT the ENDS of the antenna). A side note here and this is important! The signal will be just as strong off both sides of the antennas, so you don't know precisely where the radio tower is yet.

Since the line will point in two compass directions and it is giving you what is known as a “Bearing”. With one line, this is the approximate direction of the radio tower. We do not yet know which direction along that line the radio station happens to be. But, now with your walking shoes, map, compass, pencil and umbrella if it is raining, walk down the block from your home. Walk at least to the next block around the corner somewhere about 90 degrees from your original bearing line. You will see why in a moment.

At some point when you can identify your location on the map draw another dot where you’re standing, turn on your radio and turn it getting the maximum and minimum signal again then chose the max signal and take a compass bearing. That bearing will be generally towards one end of the original line, or the other. Plot a second bearing line, just like you did before and you will now something interesting. (Another note, you don’t really NEED the compass but it might help to give you some other ideas on what a bearing is used for...) Somewhere along those two lines (if extended far enough, if the station is distant) you will see the two lines cross each other. All things being equal, where those two lines cross is approximately where the radio station antenna is sitting. The further off from your original position in some direction that you take your second reading, the better the “fix” becomes.

If you want to be sure, take a third reading from yet another location. Where the three lines cross you will either have a dot (very rarely) or you will have a small triangle where the three lines cross. Inside, in the center of that little triangle is the actual location of your targeted radio tower. This is “triangulation” (get it, see the triangle?) – Anyway, this is very, very easy to do and anyone who knows the technique can use it. The technique can be used on ANY radio frequency, though higher frequencies are easier because they have shorter antennas, but as you go to different frequencies you have to have more specialized antennas and sometimes other equipment which is beyond the scope of this text.

The point here is to prove to yourself that someone else can locate **YOU** when you’re using a radio transmitter. They don’t have to be exceedingly sophisticated computer/radio geeks with vans full of electronic gear and spectrum analyzers – simple methods work just fine.

There is a way to reverse this process using two or more known radio stations to find your own location on a map. This is a form of radio navigation which boats and airplanes used until relatively recent history. Some older yacht cruisers still use Radio Direction Finding. But the explanation is beyond the scope of this book.

There are complete systems that can be attached to any radio to do the same thing, giving you a compass direction, and even in some cases distance and signal strength. These are called Doppler tracking systems and can be built from kits, not that you’d really want one in “The Aftermath”... although an enterprising person might be able to find and loot active radio stations. Just sayin’....

Being found inadvertently

If you've followed along and understood the foregoing it should be evident by now that anyone who transmits a signal can be found, sometimes very quickly. If someone has the technical ability (for example ham radio operators, military units, government units like the FCC and some police tactical units, and people like the author) they can, and perhaps will find you if you are a gold mine. To be clear, this can be used for or against someone. If you're lost in the woods and trying to be found and you have a transmitter someone with a radio direction finder and the ability to use it can and will eventually locate you. Assuming you transmit on a regular basis and give them a decent baseline they should be able to pinpoint your location without a vast amount of effort, or even track your movements on a map working out where you are, which way you're going and your approximate destination, even your approximate speed.

It therefore follows the less transmission time you give them—the more difficult it becomes to find you. In a city with buildings (which can and do reflect radio signals especially at the higher frequency ranges, like most handheld, walkie-talkie type radios operate on) and in mountainous and hilly locations it can also be more difficult to track someone using a radio because you have hills and valleys blocking signals. If you're in a valley your signal won't go as far. If you're on the top of a mountain or a hill, your signal will travel for a very, very long distance giving the people trying to locate you a better signal, a good line of sight on the radio and thus a very accurate map of where you are located.

So in a survival situation where you want to be found using a radio can be a good thing to do. In a survival situation, particularly an "Escape and Evasion"[\[87\]](#) situation where your life might depend on not being located, using the radio might be a very bad thing to do on one hand, but necessary to give your rescuers enough information to find you.

By the same token if you are in a situation where you don't even want it known you are there, don't use a radio to transmit, at all, never, ever....

What we have just examined is something called radio direction finding and triangulation. Be aware that using the AM transistor radio is easy to do, and works very well at locating yourself (find two or more radio stations, usually listed on airplane flight charts or marine charts, but not on regular maps) and the "triangulation" point will be you. In other words you can locate a series of radio stations (we're assuming they are marked on your map or chart) and pinpoint your own location by using 3 or more known stations. This is the principle of "fixing" oneself on the map using bearings off known objects. Mariners use line of sight usually to locate their boats off a visible coast line by sighting objects that are high up such as water towers, buildings or hill tops that happen to be shown on the charts and taking bearings off various stationary objects. Hikers do the same thing using "orienteeing".[\[88\]](#) Celestial Navigation uses stars and planets using the same principles.

You must understand that for higher frequencies you will need different sorts of antennas which will be more directional, and perhaps some other electronics to make things work. So, while it was simple with the little transistor radio, it will be more difficult with someone using a police radio, a ham radio or even some kind of public service radio. Looking into “Fox hunting”[\[89\]](#) which is a kind of Amateur Radio Sport; it will enlighten you.

Don't be a "Gold mine"

Anyone with a radio is a "gold mine". Anyone with food, ammo, batteries, generators, moving/working cars, horses, cows, and cattle or even a cat or dog to eat will be a "gold mine" in The Aftermath. Radios, solar panels, generators, food, and many other things that are portable, edible or useful for trade or barter will become items that you can trade for or barter. Those same items will become the "gold mine" for looters and criminals too though. Advertising you have them is not a good idea. So this is another time you might not want to use a radio. And use COMSEC.

Early on we mentioned tall antennas as making you more visible. If you are a ham radio operator you might have several visible antennas on your roof, a tower in the backyard and some wires strung back and forth from tree to tree. This is an advertisement that you have radio equipment. Before "The Aftermath" this won't generally be an issue, no one cares and many look upon them as an eyesore (especially neighbors, but those people don't understand the beauty behind antennas...).

As you're crossing the boundary of "Life is good" to "Oh, Crap!" and The Aftermath is about to become reality, you might consider removing, hiding or camouflaging your antennas. If you're already over that line, you might consider just getting gone and not looking back. But let's say you're in a cabin in the woods and you're not as visible as Joe Average with his ATV, Boat and Camper at his house. Instead you're hunkered down and have a very tall antenna in the trees. Well, remove it. That's right, take it down. Use a dipole or long wire antenna instead. These are wire antennas stretched horizontally above the ground and aren't visible from a long distance off, especially if you're in the woods. No one will see them until they've seen your cabin in most cases.

You could take PVC pipe, paint it to match the surrounding area and string a wire inside and use that as an antenna. You might use really thin wire (we call it magnet wire) to make it difficult to see. You could actually use an old bed springs, metal frame of something that isn't grounded, or simply a pipe leaned against your cabin (or home) as a camouflaged antenna. This is where understanding how antennas work comes in handy. There are plenty of ideas and ways to hide an antenna but we won't go into the details as that is beyond the scope of this paper. But there are several web sites about this subject. Here are some links on the subject of camouflaged antennas:

<http://www.radiosurvivalist.com/antennas/stealth-hidden-camouflage.asp>

<http://www.arrl.org/shop/ARRL-Antenna-Book-22nd-Hardcover-Edition/>

<http://www.iw5edi.com/technical-articles/hidden-and-stealth-antennas>

<http://www.dxzone.com/cgi-bin/dir/jump2.cgi?ID=13950>

Understand though that people with knowledge of antennas will usually spot even your best attempts at hiding them, as will US military forces looking for them and foreign forces can spot them too. In a pinch the military will simply triangulate an

antenna location and lob in a high explosives weapon to take down the antenna, radio, people, building, cats, dogs, trees and dandelions nearby if they believe you to be a threat of any sort.

After about a month of no power any meat left in the refrigeration units will have looted, eaten or rotted. Store shelves will be cleaned in a week and there are going to be no trains, trucks or even military airlifts to feed people. At first there might be food drops. Later even that will go away. The US government, if it is still in existence (and we believe it will be) will try to do what they can to prevent an invasion. But there is also an equal chance they won't bother and worse might simply try to shrink the country size down to a more manageable chunk by forcing people to move.

The phrase "relocation camp" comes to mind. We're not saying they would absolutely do this, but depending on who happens to be in office at the time and how much power they want to grab, we would not rule this possibility out. This might just add more danger to your already deadly situation. If you're in a position of communicating with the acting government, you and your group are going to have to think hard about the information you pass on. Do you trust them? Are they going to help you, or are they even legitimate?

We can't guide you in every aspect of this make-believe world of the future where "The End of The World as We Know It" (TEOTWAWKI)[\[90\]](#) has happened. You will be on your own by then and with, we hope enough common sense to keep going and doing the right thing to keep yourself and your group alive.

COMSEC – Communications Security

You with your radio signals will advertise your own vulnerabilities if you use the radio in a manner that tells them where you are, your condition, and how many people/animals/trucks/guns are in your party. Remember we mentioned about self-incrimination? This is similar except now, in the Aftermath, there are no laws to worry about any more, chaos reigns supreme and the bigger gangs with the biggest guns make the rules and decide who lives and dies now. You with your radio and some supplies will become a target. Preventing giving out information is what we call “COMSEC” or communications security.

As it turns out now receiving a radio signal is still a great idea to collect information. It's not really possible to track a receiver (except by hearing its audio playing loudly, or getting within a few feet the “local oscillator” which gives off signals). When things get really bad, transmitting is probably to be avoided in all but the most urgent circumstances. You might still use a radio to signal your camp that you have an incoming group of hostiles before they are surprised, but you wouldn't routinely transmit locations of sentries or locations without using code phrases. You would not want to advertise your location exactly if you have injuries either. Bad guys, gangs, over-reaching government bureaucrats or enemy forces might make use of this information to locate and neutralize your group, even though you're only trying to survive.

Remember, in the Aftermath anything you thought you knew about human nature... ain't. Human beings are strange creatures. We are all helpful and nice to one another most of the time. When it suits us, we assist others; other times we use our cell phone camera to film a beating or a robbery without lifting a finger to do something for the victim. People will do heroic things like pull an injured person out of a burning car for no reason other than they are the only ones there with enough sense to save a life. Those same people placed into a survival situation will eat bugs or dirt to stay alive and they might eat you if that suits them at the time. When you read about the guy that goes nuts, shoots twelve people in a mall, three cops, the gold fish tank in the pet shop and then himself and his neighbors say “He was such a nice man, I never expected anything like that out of him” you have to ask yourself “Why didn't you expect that?”

Expect the absolute worst out of people when you least expect it. Criminals size you up before they rob you. You should be sizing them up too to determine if they are dangerous. This isn't just during the Aftermath; this is walking down the street and even at work. Your best friend could become your worst nightmare if things go the wrong way around simply because they know you, your strengths and weaknesses. Of course we are not advocating distrusting everyone, but rather to keep your eyes, ears and other senses open. The tide won't just turn when you least expect but it to, it will turn, be a tsunami and if the chips are down, someone is going to be collecting and stacking those chips to get on the top! (Talk about a mixed metaphor!) You just want to survive and be left alone as do most of us. But there are

those who don't care what you want and will do whatever they can to prevent you from getting ahead – or surviving.

OPSEC – Operation Security

Operations security (OPSEC) is a process that identifies critical information to determine if friendly actions can be observed by adversary intelligence systems, determines if information obtained by adversaries could be interpreted to be useful to them, and then executes selected measures that eliminate or reduce adversary exploitation of friendly critical information.

In its most basic mode you examine your operating practices to make sure various little pieces of information can't get collected by an adversary and put together to figure out what you're doing. You should be practicing OPSEC before the Aftermath. An example of this is a friend who collects silver coins. He not only collects them, he buys large quantities every month, and he talks openly about it to you, me and anyone else who listens because he believes it's a great hedge against a collapse. In fact, this friend has told me how much he buys each month, and to you, he's actually shown the floor safe. We, together, when we find ourselves in the Aftermath could go over and ask nicely for his coins. Or we don't have to ask so nicely, would we? We can even figure out how much silver we'd be carrying ahead of time and how many bags to bring. But you get the point. The old "Loose Lips Sink Ships" still applies.

Back in our scenario our hero and his wife have escaped the suburban environment they were living in before the "Aftermath" became a reality. It's been a month since whatever caused the power to go out and our hero to leave. We'll give him a name finally since we have gotten to know him. He is Joe. Joe and his wife have been lucky so far. They safely (perhaps luckily?) moved out to the countryside where so far, none of the city people have managed to get to. That doesn't mean the city people won't start showing up, but thus far it's been quiet. An old farm house off the beaten path has become their temporary home. The place looked like people were living here; no one has been back since they arrived.

Joe can only surmise that they were out in a vehicle some distance away when the event occurred and have never been able to get home. Chances are they won't return. Joe and his wife have decided to stay since there is plenty of food, and the place hasn't been raided – except of course by Joe and his wife.

Joe has been feeding the chickens and milking the poor cow since it was in dire shape when he arrived. Joe feeds the horses and lets the goats eat the grass in the yard. In fact the whole farm looked like the family had just left for a few hours.

Apparently the owner happened to be a ham radio operator and Joe finds that he was living an "off-grid" existence. For some reason the generator is working, there is gas and solar panels charging the batteries stored in a metal outbuilding and providing power for the whole farm. At first the solar panels didn't work, then Joe discovered they were bad and he located a whole set of replacement panels in a locked metal storage shed. Joe spent a day replacing the bad panels and getting power back online. Joe and his wife are now secretly hoping the owners don't get back any time soon, or at all.

Joe is a smart man and knows to take precautions though. He keeps the lights off at night and doesn't do anything to attract attention. He does not turn on and run the generator because it is noisy and will attract attention. He does turn on the ham radio and tune it around to get more information. He does not try to transmit because he knows that someone who wants to can hear and track his signal. He waits in this house for a time. He also monitors a scanner sitting in the radio room and carries around a small handheld scanner that is apparently programmed for everything from CB to local police frequencies. He had heard nothing since they arrived and he figured out how to turn on the radios.

Eventually, all good things must end. Joe is alerted by the scanner, a group of people on motorcycles were advertising their position, what they are doing, what they have done. Joe spends some time nearby observing the people he is concerned about, and counts them, knows their mode of conveyance. He can see they have some practiced skills at guarding their camp and figures out that they are preparing to come to the farm where his wife and he are located. He figures they will hit late that night or the next evening because of their behavior, they're packing up equipment and cleaning weapons. Joe decides it is time to leave.

Joe alerted his wife, prepared the horses and took one horse as a pack animal and they make their way off the farm, but not before they disabled the batteries, solar panels, and generator and cut as many of the wires as they could. Why leave this stuff for looters and criminals to use against them? They also poured anything they could find into the underground gas tank to destroy the gas. They released the cow, goats and chickens and shooed them into the crops hoping they would escape. There were some weapons in the house and they were loaded on the pack horse and the animals. Joe and his wife are miles away by the time the motorcycle gang rode up.

The reason he knew they were nearby was because they were using their stolen ham radios. They were using devices that were on the two meter band (140-144 MHz) and Joe was listening. They had already scoped out the farm and were planning to hit it. Joe and his wife however, were already gone because he has "seen them coming".

Joe and his wife were once again prepared and escaped with their lives, due to a combination of communications and observation of the adversary. This time Joe never passed a single message to anyone via the radio, was careful to remain unobserved by the bad guys and he collected information about them. He listened to the bad guys and they gave away how they were moving, when they were moving and how many were there and precisely what they were going to do at the farm. In short, they didn't use Operational Security and they severely lacked any semblance of Communications Security to maintain their secrecy, and thus our "hero" was able to escape and prevent them from coming after him.

So we can see there are times to use a radio, and times you shouldn't. In the next chapter we will discuss the various types of radios you could find and use, buy and use, and well... steal and use. Now don't get us wrong, we're not advocating stealing or doing anything illegal here but there will come a time when it won't make a difference to anyone except you. If there ever is an "Aftermath" situation we will all find ourselves doing things we wouldn't do under normal circumstances and some of those things might be things we would frown on others doing today.

When it comes down to weeks, or months of living in the "Aftermath" we can assume that something will eventually happen to lighten up the situation. Perhaps the Russians have stood down and are no longer attacking, the USA is rebuilding itself or smaller, localized governments are now working to pull things back together. At this point in time your use of communications might be to help your own enclave (assuming you've put one together or fell in with a friendly group of folks) and you might want to get in touch with the acting government to receive assistance or offer your own assistance to right the wrongs.

This assumes the situation gets better and not worse of course. As always we're going to expect the worst but hope for the best. In any case Joe and his group have gotten word that there is a temporary government set up and there are radio frequencies given to listen on for information. So he helps the group set up a radio they've taken from some looters who attacked a month before and they get it working. The interim government is asking for people with shortwave radios to contact them on a certain frequency to let them know the status of the region. Since Joe and his friends are the local "government" now, they vote on whether to contact the new interim government. The vote is to the positive, everything works out when the government states they will send a plane to drop food.

When the plane comes over and makes the airdrop the people are ecstatic. It appears the troubles are over. Fortunately they find food in the dropped containers and the containers weren't really bombs. The "War" or "Aftermath" is nearly over. Maybe....

Table-Topping, War Gaming, and Thought Experiments

Yes our scenarios might happen or they might not. You will die if you can't think outside the box in these cases. In truth the military does something called "War Gaming". CEOs and Boards of Directors do "table-top" exercises. FEMA practices table-top exercises with the Amateur Radio Operators, Emergency Operations Centers and others. Survivalists, those worth their training and weight, have sat and did the same thing, perhaps as a "thought-experiment". In all these cases, we are all doing the same thing. We are opening our minds to the possibilities, to what might be, to those things that are unthinkable but could just happen given the right circumstances. You are "war gaming" the possible outcomes given a specific set of circumstances, and working out various outcomes, good and bad.

If you are not "table-topping" or "war gaming" or "thought experimenting" you are not really ready for whatever might happen. Even those people who are using situational awareness walking down a dark and foreboding street at night are "war gaming" their way to their destination. They are watching the situation; they are thinking about the "What if something happens" question, they are seeing the possible thugs over on that corner, the cops driving by over there. They are considering what to do if attacked, fight or flight. If fight, what techniques are to be used? If flight, which route will they take or how will they escape otherwise?

The author has been told to his face that all the above is a load of bull crap and nothing anyone can do is going to stop the thugs except those cops over there, and escape is probably not possible so "just give up and give them your wallet". Right.... That's the attitude of a loser, or a "Lucky Survivor" because if they do give up the wallet, they might still end up dead. Or maybe they won't. If not, then they were definitely lucky. I'll personally take my chances with saying "no" and running or fighting – and war gaming my way in and out of the situation. Hopefully, if I thought things through correctly, I didn't get into the position of being on that dark street, in a bad neighborhood, late at night and being robbed anyway.

Amateur Radio vs. CB Radio vs. Other radios

Amateur Radio

We know the purpose each of you is most interested will be long term, future use emergency, long range communications. At the very least you will want to receive radio signals, not just locally, but long distances away. This gives you the ability to evaluate what the news is saying about the situation you're in. So, your radio should also be a General Coverage receiver.

As previously explained, a general coverage receiver will be able to pick up frequencies from (generally) below the AM band, in what we call the Very Low Frequency (VLF) band, the AM band (about 530-1800 KHz. Such a radio will also pick up all frequencies between 1.8 MHz to about 30.00 MHz. There are several types of modern transceivers you can purchase that will do this, and some will also transmit on certain bands. There are a few older radios (using tubes) that can cover some bands, usually in the Amateur Radio bands. It is more difficult to locate and purchase transceivers that cover all frequencies, and more importantly, the price starts going up drastically, into the thousands of dollars.

Emergency communications is what we're after, thus keeping this in mind let's examine a few types of radio systems.

The very first thing to do is to step back from all our previous scenarios (keeping them in mind however) and take a deep breath. The world isn't falling apart right this moment and you have time on your side to consider all the various possibilities, scenarios, science-fiction and science-fact and evaluate your personal requirements for a long term survival condition. Life is normal right now, the days go as usual, folks come and go, count on their cars, refrigeration, online banking, and bill paying. They have their music; iPod, iPad, iPhone and iWhatever are all working just fine. There is little or no chance for a surprise nuclear attack on the country, and there's no hurricane or blizzard in sight for a few weeks or months. Now is the time to evaluate your personal ideas and lifestyle and examine "the what IF" of the excrement hitting that impeller device.

For instance do you want to be able to set up and carry radio equipment to stay in touch with a core group of people you're working with? Perhaps you're a loner, no family and you have no plans to fall in with a group of other survivors. Perhaps you have a family and plan to stay put when the real world becomes starkly unreal, remaining at home and hunkered down until it all blows over (and it might blow over).

You need to sit down and get yourself a note book and write down what you think you need, what you want to have and what you can afford, what you can maintain. In that notebook, you should write down WHY you think, want, need and can afford. You might have already started that sort of a notebook. So now you need to decide what you want your communications ability to be like in the Aftermath. Will your equipment be highly portable? The answer is, probably, because you might need to move fast and light. Will your equipment be powerful? Probably not because this

takes big batteries, AC power you might not have, and heavy wires you might not wish to carry. Will you load all this stuff into a car, truck or van to go? If so then you're going to need equipment that mostly operates from 12 volts DC power that a vehicle provides (and you will have to add in wiring, fuses and antennas, connectors and so forth).

Every device is different; most have different connectors than another, similar device and different frequency bands (frequency ranges) and use different antennas. What we will do is concentrate on the fact that you have time to work on this, perhaps some extra money to spend, the inclination to do the work required to make your radio system work, and even time to train others in its use. Another thing we should determine is whether you want to spend some time learning some of the theory behind antennas, radio transmission and so forth. It might be helpful to learn this so in a pinch you can throw together whatever kind of antenna you need to make your radio receive a signal.

Before we go on, let's reiterate something we spoke of in the Legal section. If you're going to operate a radio transmitter in the United States, there will almost assuredly be Federal Communications Regulations regarding the use of transmitters for the frequency you chose. If there are not, then those are public use bands and there will be strict limitations on the use of those frequencies as well, including antenna length, power output (or input to the final amplifier).

Again, we don't care what you do, just don't point at us and say "They said to do it". We're not saying that, and won't. Some years back we got into an argument on a web site regarding "getting a license". The folks arguing with us were adamantly refusing to do so, on the grounds that they didn't want the government knowing they had radios. They didn't want the government intruding in their lives. They argued that if the government knows you have a license they know you have a radio (a good assumption) and that they can come take those radios from you in a bad circumstance, or if they become a police state. They even argued that they would prefer to remain "illegal" no matter what. We are not sure what that meant, but it was their argument nonetheless. Those people who argued the point, much later in time ended up being caught transmitting on the Ham Bands because they didn't think to worry about triangulation. They were fined heavily, had their equipment confiscated, and to this day we don't know what ever happened to them. Operating illegally on ham bands is one of the quickest and surest ways to get into deep, hot water. Ham Radio operators police their own frequencies and will certainly "turn you in" if you're interfering with their hobby. In the Aftermath, no one is going to do it. ***But, remember, right now is not the Aftermath.***

Whatever you wish to do is up to you, however, so are the consequences. We are trying to make sure you understand that this paper is considering the "What if" of a thing, rather than "this is absolutely going to happen". The world might come to an end tomorrow, or we might kick out the current group of politicians and get some better ones in office next month. We might get worse politicians. Either way, one

must act in their lives as if tomorrow won't end because if you run around doing illegal activities you'll eventually get caught and paying the consequences.

Most of you probably aren't ham radio operators, and many of you don't want to be. That's fair, and fine.

But if you want to operate a ham radio, ***that is transmit a signal*** on Amateur Bands, then get the license. Take the time to study and do the testing required. It's cheap and easy to do. The testing is administered by other ham radio operators who've been nominated to be "Volunteer Examiners" and you will find them all over the country, in different cities and states, ready, willing and able to help. You will find that most ham radio operators will assist you in getting your license as well.

We can't emphasize this enough. Do not pick up a radio and transmit 1) Unless it is a real emergency, 2) unless you are licensed to do so, 3) or you are "authorized" to use that radio in some other fashion (i.e. security guard, police officer, military personnel, construction worker or someone else who normally uses radios in the course of their jobs).

With that all stated we will shortly discover there are several no-license-required services that can be used without all the licensing nonsense that goes along with the other services.

We do, however advocate the use of Amateur Radio for a dozen reasons. We will list some.

- 1) It is a good hobby to have and there are plenty of people to talk to in the world.
- 2) Hams are trained for long distance communication and it would do one good to learn from them.
- 3) Ham radio equipment can be obtained used, inexpensively from "Swap Fests" or "Ham Fests", and sometimes for free from other hams.
- 4) Ham radio can be as simple or as complex as you feel comfortable using.
- 5) Hams are good folks and you will be surprised many of them think like you do.
- 6) It's fun to be able to talk to someone in another country, using voice or Morse code, or other modes.
- 7) It is easy to get your ham license, but you will need to learn some basic radio theory.
- 8) Ham bands cover from Extremely Low Frequencies to Extremely High Frequency allowing you to talk short or long ranges, use various and different modes of operation and use specialized, digital communications such as teletype, packet, even satellites and other modes we won't go into here.
- 9) Ham antennas can be simple wires, or complex arrays of towers, directional or omnidirectional.

10) Ham equipment can be portable or fixed. You can grab a small handheld, walkie-talkie radio and using repeating systems to talk vast distances beyond your own radio's capabilities.

11) Repeater systems are built all over the county by hams, so that other hams can communicate, and are free to use.

12) Ham radio gear can legally be built from equipment outside the ham bands (you can convert radios to the ham bands legally)

The only thing you really can't do on ham radio is conduct business. Once you begin learning, you might be surprised at the knowledge you gain and how it can be easily applied to a "Survivalist mentality".

There are many more reasons to examine and consider using amateur radio as your communications. When the world really breaks down, a nuclear war starts, or Yellowstone blows up you will already be prepared for keeping communications lines open across the country and can help keep the US going. Maybe that's not your cup of tea, but if you have the knowledge you can use that knowledge to save yourself. Understanding and operating amateur radio equipment will give you a lot of insight to many aspects of "staying alive" you might otherwise have neglected. Amateur radio has saved a lot of lives by giving warning of tornadoes and severe storms. Ham radio has helped in everything from floods to car accidents to forest fires to the delivery of babies. Ham radio has helped get medical assistance to small islands where someone needed help. Ham radio has helped sailors circumnavigate around the planet, and pilots handle emergencies. Ham radio has allowed astronauts on the International Space Station to talk to family members and people on Earth when they are not busy doing work.

Currently (as of 2013-2014) there are three classes of licenses available in the USA. They are the Technician Class, General Class and Amateur Extra Class. At this time there are probably more Technician class licensees in the United States than any other as this is the "Entry Level" license class, it is simple and easy to get and children as young as five years old can (and have) taken and passed this test.

The next class up is called the General Class and it is sort of the "Journeyman" license in that it requires a lot more knowledge, but gives you the ability to use many, many more frequencies and bands than the Technician license allows. In fact, you can use nearly all of the available ham radio bands, including the HF bands (those are the shortwave bands of Ham radio). ***Most of you will want this class of license as opposed to the previous class or the next one we will discuss.***

The last license class, the Amateur Extra Class license is a little like being the Tenured Professor of Radio on the Ham Radio Block. You have a very difficult test to pass, a lot of information to assimilate for this license, but you can be a teacher (what the hams call Elmer) and most other Ham folks will listen to you blather on about antennas, radios and deep electronic theory and knowledge, hanging on to every word you say. Ok, not really, but it's the fantasy all of the "Extra Class" guys have (including the author) which is rarely ever achieved. In theory, you have as much

knowledge as you need to experiment and build equipment, antennas and talk to the Moon. (Which Hams actually do, talk to the moon that is – something called Moon Bounce and it's literally what it says. Bouncing signals off the Moon, because, well, they CAN!)

Most folks will never bother getting this license and indeed it is the least held number of licenses for hams in the USA. Your best bet if you're going to go with Amateur Radio is to get your technician license and learn what you can, take the test for General and hang there in the bands listening, learning, talking to others until you get the hang of things and understand how radios and antennas work. Remember your initial goal is using this stuff eventually as a survival tool.

Many Hams know more than just radio theory. They study electronics as well and can repair, rebuild or refurbish old radios. Another reason to become and get to know other hams!

A lot about Ham radio can be found here:

<http://www.arrl.org/>

<http://wireless.fcc.gov/services/ind...ome&id=amateur>

A little about Citizen's Band (CB) Radio

As you can see from the foregoing dissertation on Amateur Radio the author tends to push this field of study as the best, all-around set of knowledge to be used in a critical, life threatening, world shattering crisis. But there are other schools of thought which we will cover, because simply put Amateur Radio won't cover everyone's needs, desires or abilities.

At this time of the 21st Century the old "CB" or Citizens Band[\[91\]](#) radio has pretty much gone by the way side. But so many of you survivalists out there have them, swear by them and use them that to skip over it would not be fair. In fact your humble author was a "CBer" back in the day before the "Convoy Song" (C.W. McCall) [\[92\]](#) or "Smokey and the Bandit" movie. Of course, truckers still use them, on channel 19 across the country to give "Smokey reports".

Citizens band was actually created to allow regular people to have some form of communications. In the old, golden days of the 1970s there were actually several "classes" of licensing for the CB radio and yes, there was a license required. It cost about \$70 US dollars, and there was a commercial version used by taxis and delivery people. The current Citizens Band has 40 channels (it used to be 23 channels) and it is in what the Hams call the "11 Meter Band" (this is from the wavelength of the radio wave). It had been "ripped" out of the ham bands in the 1960s to create a channelized structure for the CB radio system. The band is right on the top end of the shortwave bands around 28-29 MHz. As you can see or guess, this means the signal from a CB under the right circumstances and band conditions can use the ionosphere like shortwave radio does, sending signals hundreds or even thousands of miles away.

CB has several major disadvantages. The equipment is low power and can't be used reliably for long distance communications. Once, long ago "linear amplifiers" were built for these devices, but they are difficult to come by these days. Also, rules and regulations (as usual) were added to FCC regulations[\[93\]](#) to prevent Amateur Radio Operators from building them for CBers. Most of the radios made are amplitude modulated and so susceptible to atmospheric noise (there are Single Sideband units, but they are expensive). Everyone in the US has easy access to them (Radio Shack sells them!) and that means in a bad situation everyone will probably have them (See the chapter about when not to use a radio).

The frequency band is just over 1 Megahertz wide so there isn't much "radio space" in there to use so during normal, non-Aftermath daily life, the radios are usually only good for a few miles at best without having to tolerate a massive amount of noise from everyone within hundreds of miles whistling and yelling into their microphones, cursing, screaming and the occasional "hook up" between Heaven-knows-what-kind-of-people. The CB in general can't pick up any other frequencies though some do have weather radios built in, which is helpful if the weather radio transmitters are being updated (like normal, but won't be for the Aftermath).

On the plus side, the advantages of CB are that they are light weight, self-contained radios, antennas are easy to install (magnetic mount for instance), the

antennas can be made of wire and tuned easily to work if you don't have a commercially made antenna and because of the narrow bandwidth require very little tuning. An AC to DC power supply can run a mobile unit inside your home. A car battery can run one too. A car battery and solar panel combination (to charge the battery) can be used without any AC power requirements. The radios are "inexpensive" if you get a simple, 40 channel rig with AM modulation. A SSB radio will cost significantly more money. The rig and a small 12v lithium-ion battery can be thrown into a back pack to make a portable radio station to carry with you on a long trek to escape the destruction of your town, or a weekend hiking trip in the forest if there is someone you want to chat with along the way. No license is required. Under certain conditions you can listen to, and talk to people in other states that are hundreds of miles away (although this is NOT legal to do, it can be done). A CB can be installed in a car or any other vehicle, your house, or carried in a backpack with a gel cell battery and small antenna.

If it comes down to learning a bit about communications and not just throwing some random radio or walkie-talkies into your "survival storage container"—you know the one you think you will grab in the basement or garage that has food, water, a radio, fishing pole and those cool chemical light sticks in it, along with a tent and cork screw, then we recommend Amateur (Ham) Radio.

If you just want to throw something in a pack to go, a CB is a good idea. Not the best, but better than not having anything at all. And remember this; even a CB radio that has people transmitting will give you some kind of intelligence which is truly the purpose of any and all radio systems. In "The Aftermath" we personally expect all the bad guys will have CB radios and will use them constantly and consistently giving away their locations, their numbers, their modes of travel and so forth—unless they are smart, have military experience or have read this book.

A little bit about CB can be found here:

<http://www.tech-faq.com/cb-citizens-band-radio.shtml>

http://wireless.fcc.gov/services/ind...ice_home&id=cb

Citizens Band (CB)

Citizens band radio. This section goes into more detail of the history and use of CB.

Citizens Band used to be part of something called “Class D operation” – My original call sign was KCM9704 back in the heyday of the CB. The licenses were, at various times \$75, \$50, \$35 and \$25, then free. Yes there were call signs you were supposed to use every ten minutes, just like Amateur Radio. Handles were used frequently as well. A “handle” was slang for your “Callsign” which wasn’t your legal Callsign but a made up Callsign. Most people would use something that sounded “cool” like “Spike” or “Stalker”. Ok, maybe “stalker” isn’t so cool. My handle on the CB in those days was “Tigerpaw”. No clue where I got it, I think the cat scratched me or something and I was Tigerclaw, but no one could understand me so I changed it.

Currently there is NO license fee. In fact, there is no license any more. Perhaps fortunately you don’t have to have one. You can just go purchase a CB radio, anything from a “base unit” to a mobile unit that runs on car batteries or a power supply. Unfortunately, having no license means the frequencies are pretty much unregulated, shared with everyone else (which is good because you have others to talk to), but a lot of foul language passes through the airwaves. Perhaps this doesn’t bother you, or perhaps you want to shield your children from such things. Either way it is something you should know.

CB frequencies are in the 11 meter band. For the uninitiated, this is about 26-28 MHz. Basically, this is the top end of the HF band, which of course is affected by the ionosphere under certain conditions. If your radio is having a good day, your antenna is the best it can possibly be, the conditions are just right, you can bounce a signal off the ionosphere at certain times of the day, and talk around the country. Is this legal? No, not really. There is an FCC imposed “155 mile limit” and you’re not supposed to talk to people in foreign countries (Canada and Mexico are included). You can find all of the rules for all classes of radio operation on the FCC site. But people do talk to foreign countries, over the 155 mile limit and at times you’ll find them running higher power than is legal.

The reason CB was called “Class D” was because the rules for CB operation fall under FCC Regulations, Part 95, Part D. Amateur Radio operations fall under Part 97. There are 40 frequencies. There used to only be 23, but this was changed in the late 1970s or early 1980s (I don’t recall the exact date, but I recall a lot of new radios coming out in that time period). CB radios have been modified so that higher frequencies can be listened to. This generally puts the radio into the lower 10 meter band, which is a ham radio band. Most of us hams frown on folks using our frequencies without licenses, thus, we will hunt you down. That’s actually not a joke. If CBers get into our frequencies, especially the low end of Ten Meters, it interferes with our “Novice bands” – and Morse code signals.

There is nothing more irritating than talking to a new person on slow code, when some CBER jumps in on Single Side Band and starts cussing over the top of a CW signal. It’s difficult to convince a new person to continue with the QSO (conversation) when they are scared at making contact to begin with, and now they have QRM (man-made interference) they can do nothing about. It usually puts them

off quickly and they cease the conversation. Most hams have the ability if they have taken some time to learn how, to do direction finding. A few folks usually can get together and triangulate the offender rather quickly. I've seen people located in a given area in less than five minutes. My advice is to not modify radios to function outside of the bands under normal circumstances. In fact, it's not legal for you to modify a CB outside of the band, unless you're a Ham and putting it on the Ham bands for your own use. It is NOT legal to modify a ham radio into the Citizens Band.

A list of Citizens Band frequencies can be found below.

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
1	26.965	11	27.085	21	27.215	31	27.315
2	26.975	12	27.105	22	27.225	32	27.325
3	26.985	13	27.115	23	27.255	33	27.335
4	27.005	14	27.125	24	27.235	34	27.345
5	27.015	15	27.135	25	27.245	35	27.355
6	27.025	16	27.155	26	27.265	36	27.365
7	27.035	17	27.165	27	27.275	37	27.375
8	27.055	18	27.175	28	27.285	38	27.385
9*	27.065	19	27.185	29	27.295	39	27.395
10	27.075	20	27.205	30	27.305	40	27.405

* Channel 9 is ONLY to be used for emergencies. Please monitor it whenever possible and assist anyone that asks for aid.

Citizens Band has three modes of operation. Amplitude Modulation (AM), Upper Side Band (USB) and Lower Side Band (LSB). Technically, single side band (SSB) is just another aspect of AM. However, it is considered like “three channels” by Cbers when you are on channel 17, and go to AM, LSB or USB. Problem is, it really is still only one channel, but three slightly different methods of sending out intelligence (intelligence in this case is “audio” and can be any sound). Occasionally, you won’t hear any “intelligence” on a CB at all, even though a lot of people are talking.... (:Grin:).

CB radios capable of SSB operation will be more expensive than a little mobile rig you can purchase anywhere from 30 bucks to 300 bucks. If you want to get one, go hit a pawn shop and see what you can find, or pick up something cheap from Radio Shack to play around with. You will need to buy an antenna (again, Radio Shack will have a selection of mobile antennas you can use, or you might build one... we'll get into that sort of thing later). One other things about SSB, the signals tend to “go further” because you’re taking all the extra power out of the other sideband and putting it into the one you’re using (Upper or Lower) and giving yourself a bit more “peak power” on the signal. The science behind it is more complex than we care about at the moment.

What are they good for? What can you really use a CB for? What about survival communications? Can I use one anywhere?

CB radios HAVE saved lives. There is actually an organization called REACT – Radio Emergency Associated Communications Teams (<http://reactintl.org/>) which will help you get set up to operate as a REACT station if you have the desire, or perhaps a need in your local area to assist motorists traveling through the area. The author belonged for many years to REACT before becoming a Ham.

I have heard many stories about CB radios saving lives, but in each one, someone else was listening and took some action to assist those in trouble. That’s the point I suppose of having two-way communications available, and listening to it – to be available to others in case of need. By the same token, if you’re the one in need, you’re going to be hoping, praying and cussing about someone listening in. So essentially, this means any sort of communications is, well... better than nothing at all.

But, is CB the best? Is it the worst? The answer is “no” to both questions.

Cbers abound across the country and if you’re anywhere near an interstate highway; you’re going to hear Cbers talking. Some cities have large groups of people on the CB, and you will find the “regulars” on certain channels throughout some cities. I used to “hang out”

on Channel 17 in Detroit, many moons ago, and there were a lot of people there. Some had funny “handles” and some were serious, some were kids, some adults and men, women, and everyone in between. So, you will find many, many people in populated areas you might be able to talk to.

On the highway is where the CB “shines”. You get “Smokey report” – From Smokey the Bear, the type of hat most State Troopers use. You can find out ahead of time that there are congestion problems before you get to the area you’re trying to pass through, or find out what caused the blockage on the other side of the highway. You can get directions to a place to eat, sleep or you can get help finding that special place you’re going on vacation. So CBs are very good in those situations.

Most folks that go “Four Wheeling” here in Colorado tend to have a CB in their vehicle. I even used to keep one in the jeep.

If you’re caught in a situation where there is no power, and there is no way to go anywhere (say, a blizzard) a CB can assist in your rescue. People do listen in our area and if you get on and ask for help enough on Channel 9 someone is bound to hear you eventually. If you want to communicate with a lot of folks in a group that are going into the woods, then there are walkie-talkies available, or you can slap together backpack radio systems with cheap CBs, made up antennas and some portable battery packs. A little ingenuity will get you communicating with your back packing mates at a couple miles distant through even bad terrain if you have the time and inclination to set something up. Having something like that might just save someone’s life in avalanches, floods, blizzards and storms.

CB isn’t the BEST communications service available. Remember, under ordinary circumstances though, you have limitations placed on you by the FCC in the United States for the operation of CB radios. You are limited on distance you can LEGALLY talk. You may ONLY transmit “plain language” messages, meaning you can’t use secret codes, you can’t use encryption and the like. There are no other modes on CB except voice (unlike Ham radio which allows voice, digital and many other things). Radios are absolutely limited (legally) to 5 watts or so. No more. Less is ok, and you can do fine with less, but more than 5 watts under ordinary, day-to-day conditions will get you a fine if you’re caught by the FCC. If you are causing interference, you’ll eventually get caught.

CB isn’t the WORST of all communications services. No license is required. There are usually a lot of people listening, and the radios have the capability of being able to “talk skip” under certain conditions, giving you a long distance radio cheaper than many other devices. It is cheap, easy to use, easy to install as anything from a mobile unit to a home base station, to a backpack radio system you’ve rigged up. You can build your own antenna systems, if you’re handy with that sort of thing, and they will perhaps outperform anything you might obtain commercially.

Given what CB is and has become – and I’ve watched it since before the days of the big Trucker Strike in the 1970s, which is what made CB so famous – I would say that for the “average Joe” in America, CB is a good enough form of “family communications” if you have a couple of cars, you don’t go far from home and you have kids at home. Anyone can use the radio and communicate with whomever they wish.

Remember though, radio communications are anything but private. None of the modes we will discuss are “private” except cell phones, to some extent. Even then, they are still radios and subject to monitoring if you have the right technology.

Marine Radio

There are other frequencies used for various things which are available to the average person trying to decide what they will use for the pre and post Aftermath. For instance, around the coast line of the US (and other countries) the marine radio is used for ship-to-ship and ship-to-shore communications. Every boat larger than 20 feet probably has a radio and many boats like dinghies will usually carry a handheld radio. There are a lot more frequencies on the radio and you can purchase a handheld unit for around \$100 USD. There are some limitations. First, it's illegal to use it "on land" (in the United States) and during the normal, everyday situations that we tend to hope continues for us one and all, we'd not want to use it "illegally". (Note: While visiting the Bahamas recently I routinely used a marine radio on channel 16 to call for a Taxi). But in an emergency, anything goes. Again, in the Aftermath, it is doubtful anyone will bother enforcing rules. So, the next radio system in consideration for use and easily obtained by anyone in the US is the marine radio[94].

Marine radio frequencies are from about 156.050 to 163.025 MHz. This places the channels in the Very High Frequency band (VHF) and as such these are Line of Sight only. This means to transmit over the horizon (which is only about 3-5 miles usually) you have to be high up, have a high antenna or have a pretty powerful radio (50 watts) which makes the radio non-portable, only "mobile". Mobile in this case means connected to a car battery system (a car, truck, boat and so on). But, two hand-held radios can talk to one another short distances away. Also, if you're trying to use such a radio close to the shore line, you're going to be heard by others with radios. The coast lines are saturated with radios, and that includes the Great Lakes, and anywhere there happens to be a lake. Again, using this radio on land, not associated with talking with another boat is generally not legal to do.

There are 88 channels. This Wikipedia link will give you more information on the channel usage. http://en.wikipedia.org/wiki/Marine_VHF_radio

Family Radio Service and General Mobile Radio Service

The next radio system to discuss is really a combination of two services, even though they are completely separate services. There is the “Family Radio Service”(FRS)[95] and the “General Mobile Radio Service” (GMRS)[96]. They are similar thus we will discuss them both in the same section. The two services share some of the same frequencies (the first seven channels). They are dissimilar in that the former is a non-licensed and power limited (500 milliwatts or less. For the non-technical, that’s one half of a watt) radio and the former is a licensed service with power limited at 50 watts.

The GMRS currently has a licensing fee of \$85 USD and can only be licensed now to individuals. One license extends to cover the licensee’s family though and the term of the license is for 5 years. By the way, you don’t need to have a license in hand to purchase any radio gear in the United States (so far). No examination is required to obtain a GMRS license. The disadvantage of both services is the frequency band, which resides in Ultra High Frequencies, or UHF. These are pretty short wavelength radio waves and bounce off anything without penetrating. Well, not precisely but for our purposes you can’t really stand inside of a building made of metal and expect to talk very far.

The GMRS would be the alternative to ham radio if all you require is short distance communications. Remember that with Ham you have shortwave frequencies (again, 2.0-30.0 MHz) available to transmit on and listen on. Long distance communications is easier with ham radio than the others so far. The advantage is there is no technical testing required, you just pay a fee for the license and renew every five years. The fee, however is high compared to ham radio (where you pay a fee that is usually around ten dollars and that goes to the people administering the test and not to the FCC or Federal Government).

Information about GMRS can be found here:

<http://www.provide.net/~prsg/wi-gmrs.htm>

http://wireless.fcc.gov/services/ind...general_mobile

Information about FRS can be found here:

<http://www.electronics-tutorials.com/frs/family-radio-service.htm>

<http://wireless.fcc.gov/services/ind...home&id=family>

Almost any information you need regarding any PERSONAL radio service can be found here:

http://wireless.fcc.gov/services/index.htm?job=service_home&id=personal_radio

Shortwave Listening (SWL)

What is HF and Shortwave?

Let's talk about shortwave radio for a bit. Shortwave communications take place in the High Frequency (HF) bands from about 1.9 Megahertz (MHz) to roughly 30 MHz. This particular band really starts at the top of the regular AM band that runs from 590-1700 or so KHz. Some of this is being repeated from other sections to bind it all together.

HF has a very unique property that Ultrahigh Frequencies (UHF), Very High Frequencies (VHF) and the bands above UHF do not have. That is something called ionospheric propagation. If you're familiar with Citizen's Band (CB) then you might have heard the term "skip" or "skip conditions". Basically, this is what happens when the ionosphere, a layer of rarified atmosphere at the highest altitudes becomes excited by solar radiation. These various layers of the ionosphere become like mirrors at radio frequencies (RF) and will reflect (more accurately, refract) back to the surface of the Earth at some distant location. When a station is heard via this method, we call it DX listening. DX stands for distance.

Shortwave stations are all over the world, in most countries, in almost every language of the world. Most stations are directed "somewhere", that is stations tend to aim their signals at someone in another country for news, views or propaganda. They also carry a lot of news, and are a really great place to hear others' views, even if you disagree (which you most likely will). Religious organizations tend to use shortwave to get their views out to the world as well. One of the biggest, HCJB is broadcasting from Quito, Ecuador.

The main reason for listening to shortwave in my opinion is to hear what is happening elsewhere in the world, or hear what's happening in your part of the world from another viewpoint. Since often you won't hear from other countries on the local news stations, this gives you a chance to expand your horizons. Even with cable and satellite television sometimes you will hear things you won't hear even on the major cable news networks.

Shortwave bands also contain all of the amateur radio bands, so you might consider a shortwave radio first, if you're interested in ham radio. You can listen in to many hams, but you will need a shortwave radio capable of tuning in Single Side band signals for most voice activities. This type of radio will let you hear Morse code signals as well (something else you can learn from the shortwave radio).

Antennas for HF shortwave are actually rather long, contrary to the word "short" being used. In the original days of radio the first signals used were very low frequency, long wavelength signals. A man named Heinrich Rudolf Hertz wrote papers on radio waves. Clerk Maxwell wrote theories on radio waves. Nicola Tesla created radios. Marconi and Fessenden (two more radio pioneers) worked with radios and broadcast signals with them.

All of them worked with very long wave signals in the 30 – 300 kilohertz range. We will get into some math later, but suffice it to say these wave lengths are long. A 30 Khz signal is 32800 feet long for instance for one cycle. Shortwaves and the name applied to them came from the higher frequency signals, thus “shorter wavelength radio frequency wave forms. At 2000 kilohertz (2,000,000 hertz or cycles per second) the wavelength is 492 feet. So, this is where the phrase “Shortwave” originated.

In an emergency, a shortwave radio almost always has the AM band on it as well. This will usually give local and regional news, especially if there is some kind of real, declared emergency. The ENS or Emergency Notification System will notify you with some tones and data packets, and then announcements will come through by voice warning of anything from tornadoes, to flash floods to nuclear war.

By the way, an AM radio’s frequencies are also susceptible to ionospheric propagation (or skip) especially at night time. Some night try tuning around the AM radio band and you will hear stations that might be hundreds or even thousands of miles distant from you. AM DX listening is a hobby onto itself.

What kind of shortwave radio should you get? This depends on two things. What do you want to listen to, and how nice of a radio do you want?

In the first case, decide if you want it for just casual listening, and pick out one of the radios with a built in battery pack and a hand cranked dynamo (generator). Many of these types can be found in hardware stores now, Radio Shack I believe still has a model and Baygen Radio (found on the net) has several models as well. Get one that is within your budget if you want to just listen in. We’ve found these types of radios sometimes sold in hardware stores. You can occasionally find older shortwaves at flea markets, garage sales and of course ham radio SwapFests.

If you’re going to be more than a casual listener, I’d look into a bit more expensive desk model, whether you get an older “slide rule dial” (used probably) or a newer digitally tuned radio is really a matter of preference. Personally, I prefer the older radios with band-spread tuning dials, perhaps vacuum tubes or older solid state design, which will perhaps even run from direct current (DC – batteries) as well as alternating current (AC – wall current). Vacuum tubes, as mentioned before, are not susceptible to EMP but require large amounts of energy to power.

If you would like to try listening to a shortwave radio without buying one, try this link:

<http://www.chilton.com/scripts/radio/R8-receiver>

The site, called “The Listening Post” has a web-controlled shortwave receiver. You can change frequencies and listen in. If you look up a station ahead of time, for instance the BBC, you can tune to one of their frequencies and perhaps listen in for a few moments. At least you will see what it sounds like.

This link: <http://www.chilton.com/radio/others.html> from the same site has a list of other internet controllable radios that you can try on various frequencies. This

will give you a chance to try some of them out.

Shortwave radios do not require any sort of licensing to operate in the United States, as they are receivers only. Also, you can hear a lot of other things I haven't yet listed, like military radios, aircraft, weather systems – both automated and live voice, as well as many sorts of signal types like facsimile (fax), radio teletype (RTTY), Morse Code (CW), single side band signals and many others. Some will require external devices connected to computers to copy, like fax, RTTY signals and weather data, but many times you can build inexpensive adaptive devices to collect the audio, feed to a computer sound card and then use a computer program to decode.

This is especially useful if you're trying to listen to Morse code and just don't know it. You can download programs which will control your sound card in your computer, feed it the audio from the shortwave and then have the computer decode the signals. Most programs are free or shareware, and many will have instructions on putting together simple electronic interface devices to connect between the PC and the SW. Radio Shack is a good source for parts if there are no other electronics supply places in your area.

A Radio Primer

© Original publication 1998-2013, Rick Donaldson, CET, N0NJY

(This article is not simply about radio theory. It is actually a story about childhood discoveries. However, the article will give some basic radio theory skills and teach you something about how to build a simple, but useful radio from almost nothing. RD-March 1998)

(Updated for manual publication: This article has been updated slightly since the original publication for a newsletter in 1998. The story remains the same, but some corrections were made and the drawings were re-made using Windows Paint instead of pencil drawings. RD- October 2013- January 2014)

Basic Crystal Radio Receiver

I became interested in radio when I was about 5 years old. I used to visit my great grandmother deep in the mountains of Kentucky as a little boy. She had this absolutely magnificent, old (even then) radio. It was huge, and sat on a pedestal. She had exactly one electrical socket in the entire cabin in which she lived and into that socket was plugged that old radio. When I visited her one time and spent the night sleeping on the floor of the old log cabin, I asked her before bed time to turn on the radio.

She had this elaborate tuning scheme where she fiddled with several knobs and eventually tuned in a station that was playing "The Grand Ole Opry" show. I listened for a while and then went off to bed, but not before I asked her how the voices got in the box. Back in those days, we didn't own a television, and the only radio I can recall before that one was in the car in which my father drove us from Detroit, to Kentucky. She smiled at me and said there was a little man in the radio. I laughed and said there wasn't. She reached up on top and unlatched the lid of the big wooden box and the light went out. The only other light was from the "coal-oil lamp" (kerosene for those of you that don't speak Kentuckian!) and she reached inside the radio. I was so small I remember it being way over my head. She pulled a little doll of some sort from within. He had huge, coal-black eyes and a big smiley mouth and she held him up for me to see.

"That is the man that makes the music..." and of course I interrupted, telling her it wasn't either. So, my mother and great grandmother sent me off to sleep before I could protest much more. Anyway, that was the beginning of my reason for wanting to understand radios. I KNEW in my heart my great grandmother wouldn't fib to me, but, I also knew that little man couldn't have been doing all those voices and songs by himself inside that little box! I tried several times to look inside that box, but gave up eventually. I couldn't reach it.

When I was about 8 or 9 years old, another grandmother, my father's mom, brought me a Christmas present when she visited us in Michigan. The box I opened contained a handful of wires, some plastic parts, and some metal pieces, along with an earphone and a little glass thing with wires coming out of the ends. The box said "Build your own Radio!" I thought, "Yeah... right...."

I'd already been looking inside of radios and televisions by that time, and knew there was no WAY this thing would work. Where were the tubes! Where were the batteries or the electric plug? How about a speaker!? Anyway, that evening, after things were settled down and I could sneak off to my room with my new toys, I kept being drawn to that box. Finally, I started reading the instructions. I learned it was what was called a "Crystal Radio", and wasn't quite like "real crystal radios", but would be just as good. If you have stuck with me this far you will see that I was interested in radios and communications from a very early age. And if you continue to stay with me for a few more pages, I promise a little entertainment, some actual learning and a skill you will never regret knowing. That is building a simple little radio set that you can use to pick up stations from all over the US, Canada or your region of the planet.

The Radio

About the time I finished reading the instructions on how to put this thing together, I began to realize that the people that had put the kit together were dead serious and were promising me that it would pick up AM radio stations. I still couldn't believe it, but set to building the thing.

There were instructions for how to wind a coil of wire, and they were very precise. Also, there was a long metal rod, a little longer than the length of the coil, and a brass ball with a hole in it. It was supposed to slide along the brass rod, and after being mounted inside of the plastic "radio box" the coil would mount inside. Some metal clips held things in place. The two ends of the wire had to be cleaned off to make an electrical contact and the length of the coil itself where the brass ball was supposed to touch also had to be cleaned of the enamel insulation on the "magnet wire". Eventually, I got to the part where I snapped the pieces in place, the wires connected like they showed in the manual and the little glass thing with two wires I discovered was called a "Crystal Diode" (ah... hence the name 'crystal radio', I thought). Actually, I learned much later that wasn't the origin of the name, but for my eight year old mind, I was already seriously stretching electronic theory!

Well, that night, I finished the radio and just before I was going to put the headset to my ears, my mother called in and told me it was time to get to sleep. I reluctantly put the thing away on my dresser and went off to say good night to the adults and my siblings (some of whom had toys with batteries and were already running them down).

The next day, I basically forgot about the radio until later that evening. I remember playing GI Joe with my brothers for several hours that day. When I did remember the radio, I quickly forgot about GI Joe and my brothers and ran into the room where the radio was and set up out onto the desk my brother and I shared. I hooked up the earphones and started listening. I ran that little brass ball (connected to the plastic push-lever that moved it) back and forth a million times and heard... absolutely nothing. Not a sound escaped from the earphones. I thought they might be broken, so I kept messing around with them until I ended up breaking one of the earphones. Mad at myself, I grabbed the instructions once more and started reading. I read them over and over. I was missing something.

The thing I was missing was the back page of the manual. It was only about 8 or 10 pages, but the very last page, the one I needed was missing. After digging through all of the stuff piled in the bedroom floor, I found the page I was missing. It was talking about an "Antenna". Not only that, it was talking about something called "The Ground". I couldn't see how the "Ground" was going to help me get this stupid box working. There were no batteries and I'd broken one of the earphones already. This called for some special work. The antenna was supposed to be a wire, at least forty feet, stretched from my house to a tree. The only tree I had was about fifteen feet outside my window, and it was winter, AND it was wet and cold outside! So, I did the only thing a kid can do with the odds against him... I went and found my Father and asked him to explain this stupid thing to me.

Now, my father was, of course, the smartest man in the whole universe. Even Superman wouldn't have messed with my dad in those days. He was big, about 6'2" and weighed in at about 200 pounds. He was a Marine in the Korean War, knew karate and drove a truck when he went to work... a BIG truck. SO he MUST know something about this thing. Well, he didn't. In fact, he did help me string a wire out the window to the tree, but didn't know any more about how a radio would work without batteries than I did. Then he smiled and told me to "read the instructions". ACK! I was going to have to do this myself!

That evening, I finally got the antenna wired up, connected to the radio and the broken earphone repaired (my father DID know how to use a soldering iron). I sat down in front of the radio and began wiggling that lever back and forth. NOTHING! I was getting mad and I was going to write a letter to these people that got kids' hopes up! I had, by some coincidence, attached a piece of wire to "The Ground" clip, still not quite understanding what driving a pipe into the dirt outside was going to accomplish. At some point, after becoming frustrated, I managed to kick the wire over against the heater vent on the baseboard. I remember them in that house, because they were shiny silver and didn't match the wooden floors, or the color of the walls. I heard a "CRACKLE" in the ear phone.

This time I hooked the wire to the vent, not really caring this time if it worked. I was already thinking of ways that GI Joe could use the thing as a command post. He would appreciate the wires more than I did. I plopped the earphones that were attached to a wire head-thingy over my head and for the last time, started pushing the little lever up and down the dial. When I reached one side of the limit I could push the lever, music filled my ears. It was music from a radio play. Some applause and laughter and then the actors began speaking. I listened to the program for the better part of ten minutes before I realized this contraption was working! I ran and got my entire family, who by this time thought I was headed for the loony bin with wires all over the bedroom, and earphones on my head, and NO BATTERIES. Then my dad listened. He told me, "See, I knew you could get it working" and he wandered out of the room. No one else really appreciated what I learned that day, except me, and perhaps my father.

The station I heard was CKLW, in Windsor, Canada. That station was probably a good 25 or 30 miles from my house in Detroit, Michigan. A couple of weeks later, I went to the library and checked out books on radio, AM radio specifically, because my little "crystal" set actually was an Amplitude Modulated radio receiver. Those books caused me to continue with electronics into High School and on into the military a good many years later. I began to experiment with my little radio receiver after that and after talking someone into letting me shovel snow from their walk (I made 3 dollars!) I convinced my dad to take me to Olson Electronics where I bought a bundle of diodes, some "magnet wire" and some little boards with holes in them so I could build my own radios. While I was there I saw something I had never seen, a Citizens Band Radio. The CB actually would become my second transmitter many years later, but, that is another story. I built several radios from scratch, and mostly, they all worked.

Basically, after I learned all I could about AM radios, I read other books on the theory of how radios and televisions functioned. This little radio, the crystal radio, turned into a hobby I kept all my life. Every so often I will throw together the parts to make one, use it for a while, and usually give it away to someone who's never seen one before. It's been a few years now, and the last one I built went to a student at the technical school at which I was teaching. Those of you that have read thus far are asking, "When is this guy going to shut up and give us some real instructions?" Well... in the next chapter. Go get a cold drink (or a warm one if it is winter time where you live) and take a break for a bit. When you come back, be prepared to read some slightly technical material. I promise not to make it too technical for those of you that don't know anything at all about radios. See you in a few minutes.

The Simple "Crystal" Radio

Welcome back to radio theory 101. First of all, let's talk about the 'theory' behind radio signals, as it will help you to understand more about why you are going to be winding coils, and stringing wires high in the air above your head.

In physics, a radio signal is considered to be a 'wave'. A wave is simply an electromagnetic waveform. An example that you could see would be dropping a pebble into a calm pond. The ripples you see are waves. Another example would be to take a rope, about fifteen or twenty feet long and tie it to a doorknob or other stationary object. Now step back to about two-thirds the length of the rope and begin to whip the loose end up and down. The motion will carry over in the rope, and create a wave that moves toward the stationary tie point of the rope. Basically, that is a wave. Sound also travels the same way, as waveforms, but sound waves are much slower than radio waves.

Radio waves travel at the speed of light, which just happens to be approximately 300,000,000 meters per second. That is 300 MILLION METERS in one second. In another measurement, light travels at about 186,000 miles per second. For anyone that doesn't know, in US measurements, one meter is equal to 39.37 inches, or 3 inches over a yard. Incidentally, sound waves travel at about 1130 feet per second at sea level and a little slower at much higher altitudes above sea level.

Radio and light waves travel at about the same speed, no matter if it is in air, or in a vacuum, like space. A quick reality check is to think back, if you remember the moon landings. There was about a 3 second delay from the time you heard Houston Control end a transmission, and the beginning of the transmission from the astronauts on the moon. The reason is, the moon is just far enough away most of the time for light (or radio waves) leaving the surface of the Earth to get to the Moon, 1.5 seconds later. Round trip, it takes a full 3 seconds or more if the Moon is a little further away!

Since a radio wave is really an electromagnetic waveform, it has other properties. For instance, it can be used to induce current into wires. Since that is a whole different class on physics, we won't delve too deeply here. Suffice it to say that when a radio wave cuts across or passes over a wire, a current is induced into that wire. This current is the essential part of the radio wave we need to "grab" from the air to collect the information or intelligence on the radio signal. Intelligence can be information, music, pictures (like television) or even occasionally, news reports! (Sometimes there isn't ANY intelligence in news reports!) Our basic "Signal capturing device" is nothing more than an antenna! A simple piece of wire will usually work for this.

Once we have that radio signal captured on the wire, we have to give it some place to go. Something I mentioned in my story was the idea that "The Ground" had something to do with that radio working. Though I didn't realize it when I connected that wire to the heater vents, I was 'grounding' my receiver. I understand it now, but didn't then.

Electrical signals (like the one we have induced into our antenna) need some place to go. The Earth, that is the planet Earth, and the earth or dirt beneath our feet will actually conduct signals. In fact, if I were to build an antenna 100 feet tall, and leave it standing in the air, and made sure to bury the end closest to the earth, electrical currents from radio signals would be induced all day (and night) long, and travel down the antenna to the earth where they would... simply, for our purposes, dissipate or vanish. What we need to do now, is to put a machine or some kind of tool in the middle, between the antenna and the ground,

to do some work for us. It must decipher that electrical signal and change it into something that we can use – in this case sound.

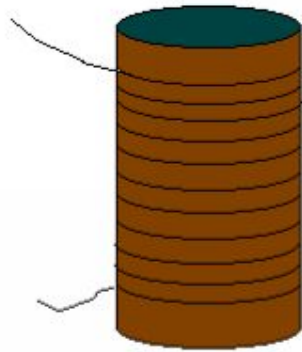
The next few pages, I will describe a simple radio that should work just about anywhere in the world. You should be able to build this simple device for very little cost, unless you want to spend more to make it look pretty or something.

The radio itself will need some things, and then you will need to make an antenna to make this contraption work. Most of these items can be obtained at Radio Shack, or some similar electronics store. There are places to mail order some parts from, but that probably won't be necessary unless you live so far away from town that it isn't worth the trip in!

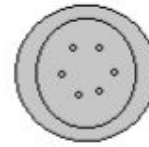
You will need several meters of something called Magnet Wire. Magnet wire is thin copper wire, covered with enamel paint. It is measured in 'gauge'. What you want is something that is not as thin as human hair, but not too thick either. It will be approximately 22 or 24 gauge. If you buy it, it will probably come on a roll and be a couple of hundred feet and I have no idea what it might cost these days. Barring buying it, you can obtain magnet wire from the inside of a transformer. Just about any kind will do, so the wall warts that you use to power telephones, tape recorders, scanners and such would work. These are usually called "AC Adaptors". Problem is you don't want to tear one up, if it works. People have broken things like that at garage sales and so on so look around.

You will have to carefully disassemble the plastic case to get the actual transformer out of the inside. I typically use a hammer. Just crack the case and pull it apart and remove the heavy metal thing inside. That is the transformer. If you can see reddish colored wire going around and around the inside of the heavy metal part, then you have hit pay dirt! Unwind all the wire and put it around a wooden dowel or something similar, you will need most of it. Once you collect the wire, you will need a coil form upon which to wind the wire.

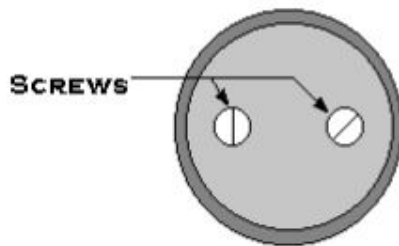
My favorite tube is easily obtainable from right around most homes. It is just the right length and width to make a coil that will allow you to tune in local AM radio stations. That tube can be found in most bathrooms, just before you toss the trash out... a (ahem...) toilet paper cardboard tube. It is 4.5 inches long and 1.75 inches in diameter. When you begin to wind the wire, you will need to lay it from one end and tape it or some other way secure it to the tube. Carefully laying the wire about ½ inch from one side, begin winding the wire neatly, and not overlapping anything. When you are finished, you should have a nice, neat coil that goes around and around the tube, leaving about ⅛ inch of space on either end of the tube. The coil, if you measure will be 3.5 inches wide along the tube. You will need to make sure the wire is tight around the tube so that it does not move at all. Once it is, tightly secure it at both ends and make sure you leave a few inches of wire at either end. Figure 1 shows you what it should look like.



**FIGURE 1
THE COIL**



**FIGURE 2
TELEPHONE
EARPHONE
(FRONT VIEW)**



**FIGURE 3
TELEPHONE EARPHONE
SHOWING THE CONNECTION
SCREWS ON THE BACK SIDE**

BACK VIEW



**FIGURE 4
GERMANIUM DIODE**

If you look at the picture above (Fig. 1) you can see a basic idea of the way the coil should be set up. Once you have the coil built, you might want to find a board or something upon which to mount it.

Next we will want to obtain some parts for our earphone. What we require for this to work is something called a "High Impedance" earphone. At the time of this writing, I know of no places to purchase the correct parts, but I know of a source that is tried and true. If you disassemble any standard telephone handset (I don't mean the new-fangled electronic telephones, but the older, 1950-1970 telephone units), you will find that the earphone portion will unscrew. By unscrewing this plastic cover and removing the metal part inside you will have exactly what we need to make an earphone. If you look at figure 2, you will see what the front of the device looks like. Figure 3 is a little larger picture of the backside of the object, showing that there are two screws. This is where your wires connect to the radio. Some of these devices had the wires soldered on. This is ok, if you know how to solder (another handy skill to learn anyway). Set this aside until we are ready to put it together.

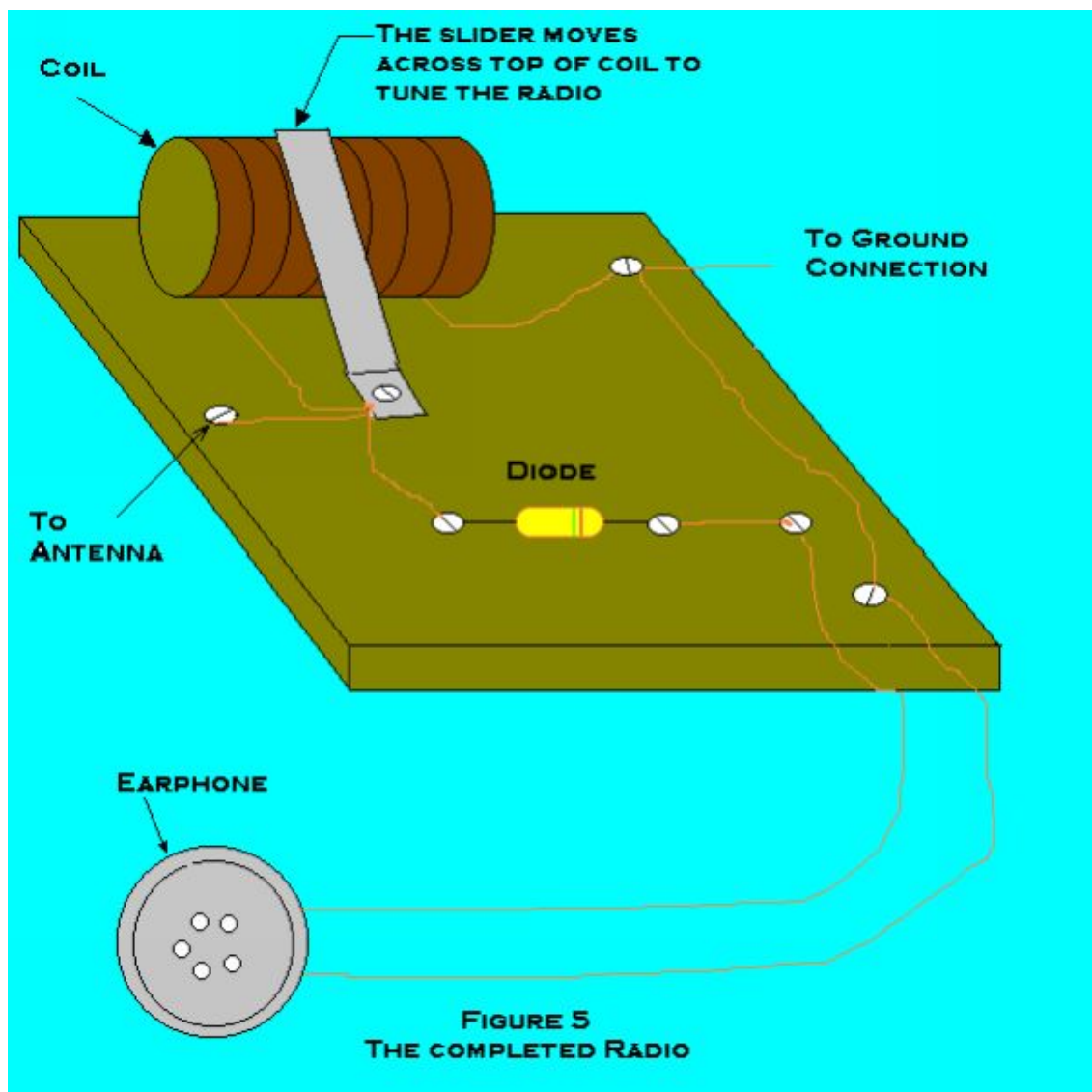
The next thing we will need is a part from Radio Shack or some other electronics supply store. Radio Shacks are usually all over the place and I know they have them in many countries besides the US. If I remember correctly, they are called Tandy Stores in Australia. Not sure about the UK and Europe however. The device you are looking for is called a 'diode'. In the past, before semiconductor devices were invented, the "crystal" of the "crystal radio" was actually a rock that contained small crystals of gallium. The "crystal" you are going to use is made of a semiconductor material called Germanium and perhaps some gallium-arsenide. No matter, these devices are so inexpensive; you can probably pick up about a dozen for a buck. Figure 4 shows a representation of what a glass encased germanium diode looks like. The colored bands are not important, but they are there in the picture to show you what you might see. They might be different colors, or only one band. However, one end will be marked in some manner. Incidentally, that end that is marked is called the "cathode" and the other end is called the "anode".

Note that even though there are some technical aspects of how a diode works, we won't go too deeply into the theory right now. Suffice it to say that the diode "detects" the audio signal from the radio signal, turning it into something that can be used to power the earphone.

So far, we have three important parts; the earphone, the coil and a diode. We also need a few more things. We will need some hookup wire; any kind will do, as long as it isn't too thick. You will require a mounting board for this radio as well, an antenna (about 40-60 feet of wire will work), some wire to make a ground connection and, we will need a 'tuner' of some sort. Your ground should be a cold water pipe, as close to where you wish to set up the radio. An antenna should be strung outside, if possible and as high away from the ground as possible. Any length of wire will suffice, with one end terminating at the point where it will attach to the crystal radio. Anywhere from 12 feet to 50 feet should work and the antenna will not be "tuned" for our purposes.

The idea of a tuner is to change the size of the coil that you have made. Rather than unwind the wire to make it shorter or longer, we are going to make a mechanical device that will allow us to make the coil think it is longer or shorter. Figure 5 shows the details, but essentially, you will need something that will slide back and forth across the already assembled coil. In figure 5 you will see the assembled device. A metal slider is mounted with a screw to the board and bent so that it will touch the coil. It can be made from any stiff sort of metal, even a tin can cut with tin-snips, or a wire mounted to the underside of a Popsicle stick would be ok. If you slide it back and forth you will see it creates a small arc across the coil. What you will need to do next is tricky, but must be done. Get some fine grit sand paper (00 if you have it should work) and lightly but carefully sand the insulation from the wire along the arc that the metal strip will eventually contact. What you are making is the actual tuner for the radio.

By adjusting the location of this slider, you will be able to change the frequency of the radio by changing the "inductance" of the coil. If the coil is correctly built, and the diode is the correct type, and you get the antenna, the ground and the earphone all in place, you will hear AM radio stations in the range of about 500 kHz to 1600 kHz, or the AM Broadcast band!

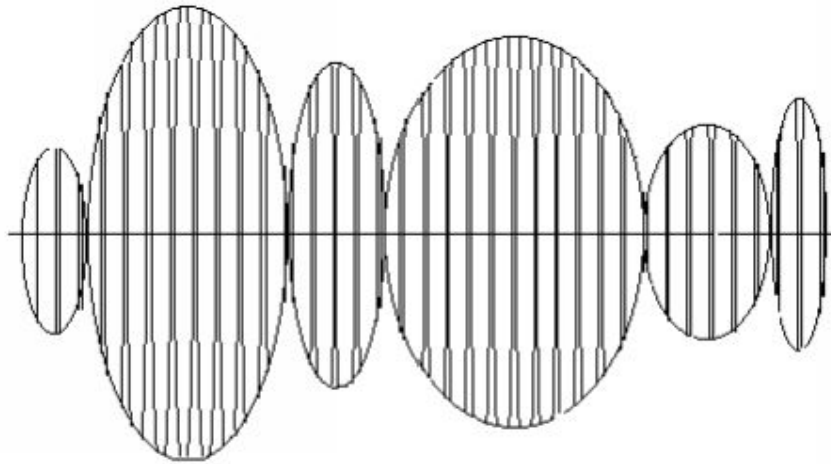


The Theory of the Crystal Radio

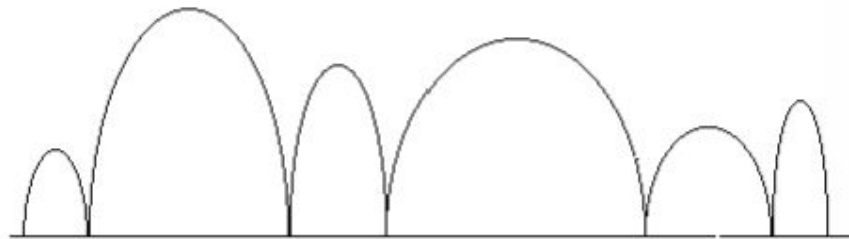
I've already given you most of the theory behind this little device. Basically, a radio signal hits the antenna, and looking for a place to "go to rest", it tries to go to ground. Mother Nature is good about trying to reach equilibrium, so the signal will seek to neutralize itself, hence (a simple explanation, granted but correct for our purposes) it tries to go to the ground connection.

The coil sets the frequency. Technically, there probably would be a tunable capacitor instead, but those are harder to find than the simple tools we have here. By adjusting the coil's physical size (that is, moving the slider back and forth) you can change the amount of inductance, which in turn determines the operating frequency of the device. The interesting part is, that the larger the coil, the LOWER the operating frequency, and the smaller the coil, the HIGHER the frequency

The diode "detects" the Amplitude Modulated signal that is riding on the Radio Frequency CARRIER wave. That is, the radio wave itself. The audio signal, voice or music, has been superimposed over the radio signal by a method called "modulation". If you had a way to see the signal, it might look like figure 6.



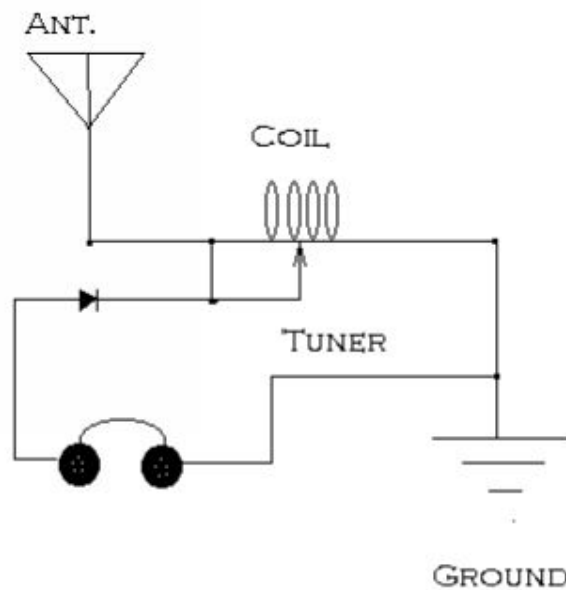
THIS IS AN AMPLITUDE MODULATED SIGNAL CONTAINING THE AUDIO, RIDING 'ON TOP OF' THE RADIO FREQUENCY SIGNAL. THE TINY LINES INSIDE THE AUDIO SIGNAL REPRESENT THE RADIO FREQUENCY, WHICH IS A VERY, VERY HIGH FREQUENCY!



THIS IS AN AUDIO SIGNAL BEFORE AND AFTER IT IS 'IMPRESSED' UPON THE RADIO FREQUENCY SIGNAL.

FIGURE 6

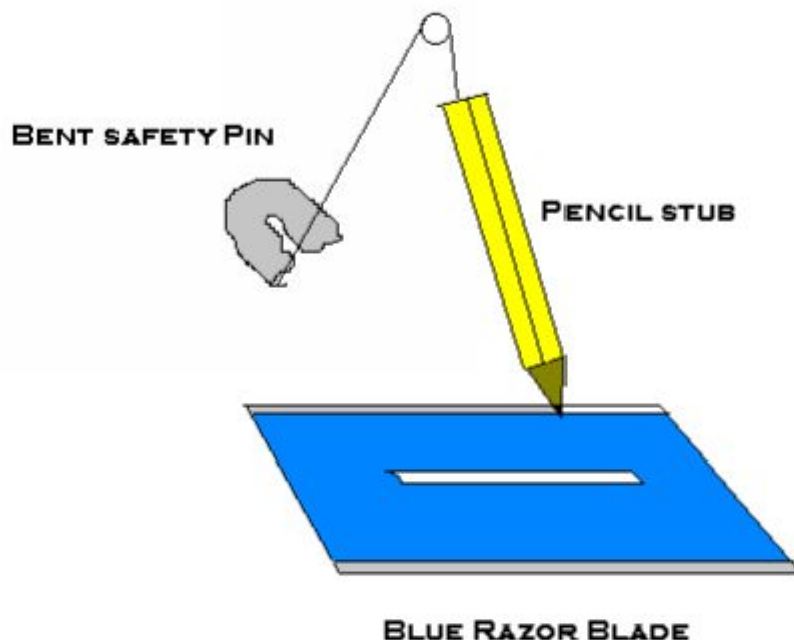
Once the diode 'sees' the AM signal coming in, it will cut in half the top signal, giving you the bottom half of the above picture. What you are seeing (ok, hearing!) is the actual audio signal as it was originally produced at the radio station. An FM signal is quite different and cannot be reproduced using this exact method of detection. It is possible to do something called "slope detection" with an AM receiver, but it is not really practical with this sort of radio. An actual "schematic" follows in Figure 7.



THIS IS A SCHEMATIC OF A 'CRYSTAL RADIO'. THE OBJECT LABELED D1 IS THE DIODE, OR WHAT USED TO BE A CRYSTAL IN THE VERY OLD RADIOS OF THIS TYPE. THE DIODE IS OF A TYPE LABELED 1N34 AND IS MADE, INTERNALLY FROM AN ELEMENT CALLED "GERMANIUM". THE HEAD PHONES (HD1) ARE HIGH IMPEDANCE EARPHONES FROM A TELEPHONE HANDSET. THE COIL IS A TUBE WITH "MAGNET WIRE" ROLLED CAREFULLY AND NEATLY AROUND THE TUBE. THE "ANT." IS THE ANTENNA, WHICH IS A WIRE 40 TO 50 FEET LONG (ABOUT 18 METERS) LONG. THE GROUND CONNECTION IS A CONNECTION TO A COLD WATER PIPE IN YOUR HOUSE, A LONG COPPER ROD OR PIPE DRIVEN INTO THE GROUND TO A DEPTH OF ABOUT 6 FEET (2 METERS).

When you don't have a diode

Now, one last item of interest, let's assume you do not have access to diodes, or crystals from rocks. What to do, what to do? Well, if you can find some old, blued razor blades there are tiny crystals of gallium produced on the surface of these blades in the manufacturing process. These crystals are deposited on the surface of the blade when they are turned blue. I realize they are hard to come by in this US these days, but there are places they can still be found. However, by itself, it won't work. You will need a tiny piece of a wooden pencil, a safety pin and in place of the diode; this little device WILL serve as the detector. Please, see Figure 8 for the details.



PRESS PIN INTO PENCIL SO IT CONTACTS THE LEAD INSIDE (ACTUALLY GRAPHITE). SCREW THE PIN TO BOARD IN PLACE OF DIODE. SCREW THE RAZOR BLADE ONTO BOARD SO THAT THE PENCIL RIDES ACROSS THE SURFACE OF THE BLADE ON THE BLUE AREA. MOUNT THE WIRES FROM THE COIL AND THE EARPHONE CONNECTION AS SEEN IN FIGURE 6, TO THE PIN AND TO THE BLADE, RESPECTIVELY. BY LISTENING TO THE EARPHONE AND CAREFULLY MOVING THE PENCIL ACROSS THE BLADE, A "CLICK" WILL BE HEARD WHEN YOU HIT A 'CRYSTAL' -THIS IS MUCH HARDER TO USE THAN A DIODE, BUT IT WORKS!

FIGURE 8

I hope this gets you started on the road to radio reception without the aid of batteries, electricity and with very little equipment or cost. I must warn you of several things. First of all, this is not that easy to make work and patience will be a necessity.

Second, when you get it working, it will surprise and amaze you that something like this will actually work! Last, you might get hooked on playing with toys like this and wish to experiment.

There are many books already published on such things, but this sort of information is very difficult to find in the library these days. Perhaps, someone is trying to keep us from knowing this kind of information, or worse, the skills to do such things have died with the older people who came up with it. In either case, this is my attempt to pass on this incredible and important, as well as useful information. I suggest you do the same with it.

Electrical Power in the Aftermath

How do I get electricity when it's not being produced commercially?

Frankly, it will be difficult at best to get and keep power after an EMP event. If the grid is down and out for the count you will have to rely on other methods to produce electricity. Some methods you might consider include solar panels, generators, car batteries (lead-acid cells), gel cells, and smaller flash light batteries (the AAA, AA, C, D and 9V types for example). You might also use a running vehicle engine to charge batteries, or something as simple as a hand cranked generator, or a makeshift bicycle-powered generator.

The problem is that batteries of all sorts have a limited shelf life. Many will last six or seven months just sitting there. Some won't last that long and some might last longer. Lead-acid cells in general will last a few years as long as they are well cared for.

Solar Panels

After an EMP event, solar panels will probably not function. Solar panels come in several types, but all of them are made using semi-conductor materials including silicon. Each cell is made of the same stuff transistors and microprocessor chips are made from and as such would be very susceptible to an EMP hit.

Panels usually are set up in 12, 24 and 48 volt systems. A solar panel only works while the sun is shining on it and therefore you will need some help to collect that energy in a useful form. That's where lead-acid cells come into play.

Lead-Acid Cells

Lead-acid cells come in several types. Deep cycle, also known as “marine batteries” are one type. Car batteries are a different type. The former are better to have to use for running equipment. The latter are ok for short term stuff, but you don’t want to run them down too far. There are entire books written on the maintenance of lead-acid cells and it’s beyond the scope of this paper to go too deeply into the theory.

Generators

Generators can run on various types of fuel. Most consumer generators will run on gasoline, but there are types that run on propane, diesel and even other fuels. The author has one that runs on propane in his small RV.

Inverters

Inverters take 12 volts DC (or some other combination of direct current) and converts in into 120 volt Alternating Current (AC) – the stuff your computer, television and microwave runs on. A large portion of existing equipment actually runs on 12 Volts but contains transformers and power supplies that step the power down from 120 VAC to 12 VDC, allowing you to plug the devices into the wall socket. In fact some equipment could be modified to run from a 12 VDC generation system (using solar/wind/battery combinations).

Inverters would be used on a “solar system” to take stored energy from the lead-acid batteries and “invert” the voltage back up to the 120AC required for your microwave oven for instance.

Non-Radio Communications

Hand Signals

One of my readers suggested I should put some information about tactical communications. Essentially he was concerned more for folks who might be moving through an area containing hostile forces. Such a group might have requirement to be radio silent, communicating with hand signals or other methods not readily apparent to others. While I have been in such conditions myself, I am not a trained “combat operator” I won’t presume to be an expert on such things and I also won’t presume to give any information that might get a person killed in a hostile area, running such an operation.

There are numerous military manuals in the public domain available to anyone seeking such information. Those too can be downloaded and placed on your Kindle or computer or printed out. However, we will point out some information regarding visual hand signals.

There are some disadvantages to hand signals. The most obvious is you must be in visual range of the other communicator. Signals can be unreliable if your team members are unfamiliar or like me, forgetful.

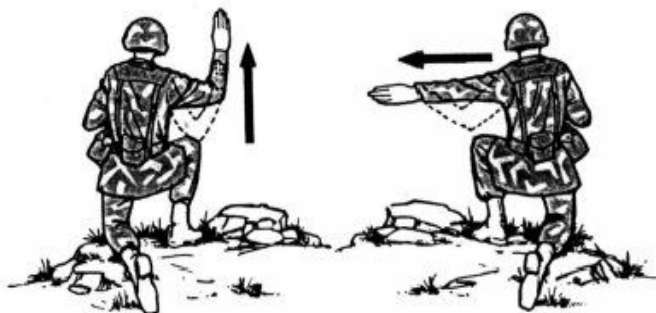
Misunderstanding signals can get one killed. Times of poor visibility (smoke, fog and darkness) can disrupt your use of such hand signals. Many military units in existence do not follow Standard Operating Procedures and develop their own signals – which might actually be an advantage for you, as you create your own signals particular to your own team members. One last and important disadvantage of hand signals would be the ability of the enemy to intercept and eventually use those same signals as a deception to you and your team.

All of that said, here’s one example of hand signals. It’s not all-inclusive. This was taken from an older US Army Manual, FM23-22.68 and in no way comprises the complete number of signals available. This is just an example and can be found here:

<http://www.globalsecurity.org/military/library/policy/army/fm/3-22-68/c05.htm>



THE READY SIGNAL



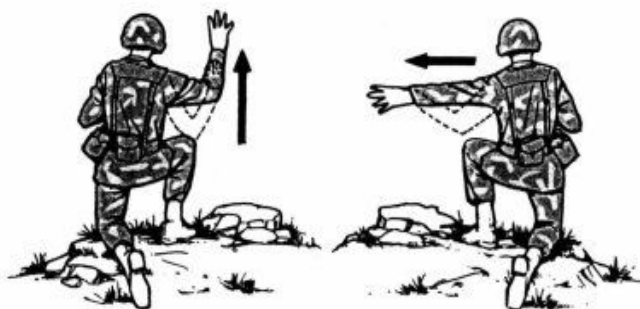
ADJUSTING FIRE WITH THE BIPOD-MOUNTED GUN



CEASE FIRE



COMMENCE FIRING



ADJUSTING FIRE WITH THE TRIPOD-MOUNTED GUN

Arm-and-hand signals (US Army FM23-22.68)

Using a Signal Mirror

If you find yourself in a true survival situation and are trying to be rescued you might need to signal an aircraft to find you. It is beyond the scope of this book to explain every possible method of signaling since it is truly a basic manual. However, you can look up “Using a signaling mirror” on Google or your favorite search engine and find several videos on the subject. You can add a small signal mirror to your daily carry bag or pack when you go hiking.

Essentially to use a signaling mirror you need to find the aircraft coming toward you, and “aim” (there are several methods of doing this) to hit the cockpit windows with a bright flash from the sun. A good pilot will be able to get a fix on your location and call in help, either ground rescue or helicopter.

Obviously you would not necessarily do this if you were trying to remain hidden, or the overflight is a bunch of bad guys gunning for you.

Whistle

A whistle, as simple as it sounds can be used to communicate with a group lost in the woods. You can locate one another. When we hiked in the mountains with our children we made sure they all carried a whistle and a small mirror. Each of them usually carried some sort of walking stick as well. A stick can be used to get you out of rough terrain, ford a stream, to beat on a tree to make noise or fend off a wild animal. When the author hikes, he has a compass, whistle, walking stick, pocket knife and usually some kind of pack with food and water. Always, always carry a jacket, extra socks and a hat and gloves in the mountains, even if it's 100 degrees.

Ground Markings

If you become lost and you have an area large enough, you can set up signals on the ground by using rocks, cloth, the snow or sand to draw images. Something as simple as writing SOS in the sand can get you rescued. There are a dozen other symbols to write or mark on the ground giving your direction, whether there are injuries and other information helpful to the rescue team. Survival manuals list this information and we suggest you consult a more advanced manual for more advanced ideas. Remember this manual isn't meant to be anything more than a very basic starter for people.

Three Fires, Three Shots, Three Whistles

Any set of three. At night building three fires in a triangle roughly 30 yards or so apart (to allow someone to differentiate the fires as a set of three from a distance), firing a rifle or other firearm three times then waiting, or blowing the whistle three times and waiting for a few moments before doing it again are all internationally recognized signals for help. If you're in a car trapped in the snow, off-road use the horn.

Essentially in a survival situation ANYTHING you can do to attract attention to yourself and your plight is what you should use.

We can't go into great detail on any of these subjects here. There's simply not enough space. There are well-written, more advanced survival manuals to assist you with the details. Here we're simply trying to get you to use your common sense, think things through and consider your options.

FAQ

Frequently asked Questions for Communications:

1) What is the purpose of the radio?

We know the purpose each of you is most interested in will be long term, future use emergency, long range communications. At the very least you will want to receive radio signals, not just locally, but long distances away.

This gives you the ability to evaluate what the news you can receive is saying about the situation you're in. So, your radio should also be a General Coverage, multi-frequency receiver.

A general coverage receiver will be able to pick up frequencies from (generally) below the AM band, in what we call the Very Low Frequency (VLF) band, the AM band (about 530-1800 Khz. The radio should also pick up all frequencies between 1.8 Mhz (1800 KHz) to about 30.00 Mhz.

There are several types of modern transceivers you can purchase that will do this easily, and also transmit on certain bands. There are a few older radios (using tubes) that can cover some bands, usually in the Amateur Radio bands.

Don't forget scanners. Many can scan even FM and AM band or at least tune them, though most scanners do not use HF bands.

It is more difficult to locate and purchase transceivers that cover all frequencies, and more importantly, the price begins going up drastically, into the thousands of dollars.

Emergency communications... keep that in mind though.

2) How much money do I have to spend?

Only you can answer this when you have completely evaluated your needs.

However, I can tell you that a good working, relatively modern ham rig will run you anywhere from around 100 bucks to as much as 13000 dollars. So you have a WIDE range of possibilities.

3) Do I want a portable radio system I can set up and make functional quickly or is time on your side?

Again, evaluate YOUR needs. This is important. There are mobile radios that will work on a car battery and work just as well as a "base unit" (as many will call it) that is powered from an AC socket.

You are thinking (I'm sure) emergency situation, no commercial power. A portable rig is better for this situation. You can pick it up, pack it up and head out with no more than a backpack with some survival food, and equipment and carry the rig with you. Most are light weight.

Again, most are also solid state.

On the other hand, you're at the family farm, with a barn, a house, and a fallout shelter and the ability to raise a tower or pole upon which to string some wires for antennas. You have a generator and several vehicles from which to power up a generator.

You have a vast array of possible setups you can examine.

Again, this is a decision you must make.

4) Solid state versus vacuum tube radios – POWER requirements! 5) Will you have enough power to run the radio you think you want or need? 6) In an emergency how will you power the device?

I combined several questions because they all concern the use of energy. This is the meat of the problem. How much power will you have? You can run a receiver only on D batteries for a short time, unless it is a vacuum tube rig. Then you need a lot of power.

Nearly every modern radio uses much less power than a vacuum tube radio will, and you can pull power from solar panels (for reception only usually), car batteries, car power systems (when the engine is running and the alternator is good), from a generator set, or a combination of the above stuff.

Remember that batteries (wet cells, aka lead-acid are most common) are readily available from vehicles (even abandoned vehicles) and most likely batteries won't be destroyed by EMP – whereas your solid state radios that are unprotected might be.

My personal, well-studied opinion is that radios not externally connected to an antenna or power source will not be affected by EMP or at least not as much as anything connected to the power grid or an external (usually outside high-up antenna). So, what I am suggesting is that if you have a solid state radio, it will be fine when not hooked up (and you can take further precautions to protect the internal components by storing the device in some sort of a metal box which will "deflect" the EMP around the radio. No, the box does NOT have to be grounded for this to work.).

What will you have in the end scenario to power your radios? You will have solar panels (that were protected from EMP), batteries and car power, or perhaps generator power.

A typical HF radio in receive mode only will draw around 1 Amp or less when in receive mode. In transmit mode a transmitter will draw anywhere from as little as 3 amps to perhaps as much as 10 amps.

A tube radio will draw 1 Amp to 5 amps in receive only mode. In transmit mode anywhere from 5-25 amps. Tubes require vastly more power than solid state transistors because higher voltages are used on the plate circuits, filaments are lit (the heater elements in a vacuum tube) and high bias voltages are used.

So you will have to carefully examine your needs and what power requirements you will have available when the situation requiring you to use the radio

arises.

7) Are you able to set up antennas, or more basically build one? HF reception requires an antenna, any antenna, and usually the longer the better.

HF Transmission requires a bit more thinking, work and scientific understanding of radio waves.

If you want to receive, really well, connecting an HF antenna connector to a wire that is about 100 feet long is usually sufficient to pick up most signals for most frequencies. While not the most efficient way to do this, it does work. Personal experience and experimentation that I've done over my many, many years says "Use anything, as long as you get the wire up off the ground, away from the ground and as high as possible, and by the way, make it as long as you can!"

In a situation where you must transmit, the same wire will work, just not efficiently! This is the key part of antennas. If you're going to receive, the worst antenna is better than nothing at all. The most efficient antennas work best on transmitters (and just as well on receivers but you don't need to get too complicated to receive).

This is where the science comes in. Knowing important things like what frequency you're listening to (and trying to answer on) is important so you can figure out the best sort of antenna and how to make it.

There are many articles on antennas out there, but I'll give you a very down and dirty example.

<http://www.csgnetwork.com/antennaedcalc.html> is a simple calculator to give you the proper lengths. Assuming you have a station you would like to communicate with on 14.450 Mhz (HF Ham Band, one we use at most times of the day because it generally is 'open' most of the time).... the calculator gives us the following answer:

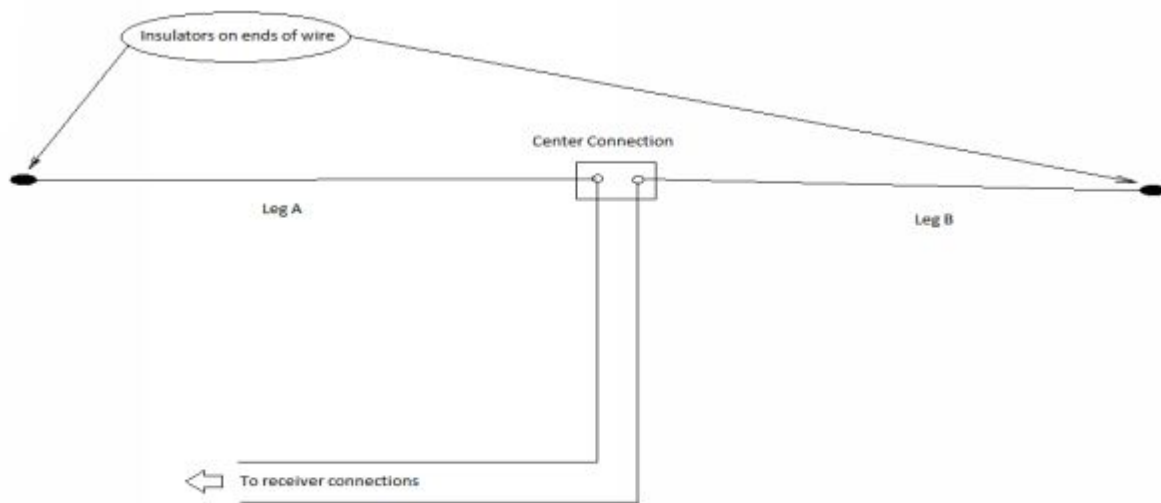
32ft. 4 – 21/32in. or 9.872 Meters

The total length of the wire is 32 feet, 5 inches (close enough for government work) and you would cut that wire into two equal length pieces of about 16'.

You will have a piece of coax cable or some other kind of two-wire cable. A piece of heavy zip cord (like used in speakers) will work. It isn't the best, but this is an emergency and you want this radio up and running pretty quickly.

Connect the zip cord to the two pieces of wire. Put some kind of sturdy insulator between the two wires so you can string the thing from two trees, the roof of the house to a tree, or between a tower and a tree or some other structure.

When you're done, it looks like this: (Approximately)



Your dipole antenna is then stretched between the house (where the radio is located) and another structure, or alternatively between two poles, trees or some combination thereof.

The “zip cord” forms your transmission line (shown as Coaxial cable in the image above) and the little green thing in the middle of the antenna is a strong, non-conductive insulator of some sort (use a plastic bottle, pill bottles, and ceramic materials, anything that doesn’t conduct electricity).

Place something similar at each end and then secure your ends with heavy string or rope over something to haul the antenna up, like a makeshift pulley or whatever.

Make the connections at the radio. You will have two ends of a zip cord. One will connect to the antenna connector on your radio and the other will go to the ground side of the antenna connection, or to the grounding screw on the rig (depends on the radio, the connections and so forth).

Now when you turn on the radio you will tune to your given frequency and when you transmit you will push most of your signal out more efficiently.

One other note here about the device labeled “Balan” in the image above. This was explained elsewhere in the text of the book, but to reiterate a balan is a simple transformer which contains a small toroidal core made of soft iron (similar to the loop stick antenna inside a transistor radio for instance) which has several turns of wire connected to the antenna on the primary side and the secondary side is the same number of turns of wire connected to the transmission line. This piece can be left out in a receiving antenna with some detriment to a radio signal. A simple dipole

doesn't require it. If you're planning to transmit on the same antenna then you would do well to learn more about antennas, baluns, transmitters and radio waves. The Amateur Radio Relay League has several educational books on the subject:

<http://www.arrl.org>

This antenna is not the perfect antenna, but... in an emergency it will suffice to get you a signal down to a working shortwave radio to pick up signals. You can also use a similar antenna on a simple AM radio and it will bring in signals much better.

You can probably, if you have the parts lying around, build something like this in less than an hour and get it up and running.

In the military we called it "Field Expediency"

You can save time by building some stuff ahead of time to use for later.

Do you have to cut your wires precisely?

No. Close is good. Closer is better. A crappy guesstimate is better than no antenna at all.

A long wire is better than nothing.

Oh... mathematics... you can do this on paper.

Antenna length (in Feet) = $468/\text{Frequency (in Mhz)}$

So in the above example: Antenna length (wavelength) = $468/14.250 = 32.84'$

8) Are you properly licensed to operate the radio during a non-emergency?

and

9) Should you be properly licensed to operate the radio during a non-emergency?

Most of you aren't ham radio operators and probably aren't going to be. You must be licensed to be a ham, and use the ham bands, VHF and HF marine band, GMRS and other services.

Before I go on I will advocate that you all, regardless of the situation in the world, work on getting a ham license. It is not difficult; you do not have to learn Morse code (though I think it is a good idea to know it).

There are three classes of licenses, Technician, General and Amateur Extra. I hold an Extra class license, the highest of the three. General is the one you want to legally operate HF radios on the ham bands (gives you the most privileges for the work) and Technician class being the lower one, gives you access to mostly VHF and UHF and other upper (above 30Mhz) frequencies (and experimental things like microwaves, satellite communications and so forth). As you go up in license class, you go up in privileges and have access to everything the lower class license has as well.

All of that said, there is nothing stopping you from obtaining amateur radio equipment and having it “at the ready”.

Now, let me bring up one more path.....

There is another type of radio... really exactly the same kind of radio as the ham stuff, but with a twist.

One of the things I will be adding to my boat eventually is a “marine HF” radio. It is nothing more than a general coverage radio that can broadcast on nearly all bands available on the radio!

In other words, it is “FCC Type accepted” for use as a Marine Radio.

I can take one of those and make it into a ham radio. You can’t legally take a ham rig and turn it into a marine radio though.

SO.... if you want one that isn’t LIMITED to the ham bands alone, then look for a modern “Marine SSB” (the sailors will call them “SSB radios” even though they are generally capable of upper, lower single sideband as well in some cases as Amplitude modulation)

But, you’re going to want a rig capable of using very little power, getting your signal out, Morse code (also called CW) and being able to travel quickly, and lightly.

I can’t recommend specific equipment because I only have personal experience with Heathkit, Icom, Kenwood and Yaesu – all of which are excellent radios and communications systems.

Most are expensive.

On the other hand, I’ll tell you if you’re digging through a ham radio swap fest ask other hams while there, what THEY think of various rigs and do some interviews. They will all talk your ear off and give you all sorts of advice. Like anything else, take it all in, nod a lot, ask a lot of questions and then make a decision based on all the input at the end of the day.

I’ll post some more modern stuff shortly when I have more time.

10) Where can I buy equipment?

http://www.hfradio.com/Stores/ssbham_store.html

(I don’t endorse any of the stores, just posting some so you can price NEW stuff).

The above store sells “Marine” SSB radios, the tuners and other stuff that go along with a rig. You need a RADIO and a field expedient antenna, and a power source to make it work.

You don’t need to spend thousands on automatic antenna tuners and Pactor modems (unless you are setting up a permanent fixed or mobile station and want to receive email via HF... I’m doing all this for my “escape pod”, but you don’t have to DO that stuff).

<http://www.hamradio.com/>

Above is a nation-wide store chain that specializes in new (and sometimes used) amateur radio equipment. Click on the various search functions and look at the types of HF equipment available. They have a place on the site to obtain a catalog. Good idea, get one.

<http://www.yaesu.com/>

Yaesu source site. They can direct you to local distributors.

<http://www.icomamerica.com>

<http://www.icomamerica.com/en/amateur/>

<http://www.icomamerica.com/en/produco/default.aspx>

Icom America. Source site. They also can direct you to local distributors. Check their prices.

http://www.kenwoodusa.com/Communications/Amateur_Radio/

<http://www.kenwoodusa.com/>

Kenwood (Do a search they have several sites). I love the TS-2000, wish I had one, or could afford it.

<http://jamaicadxpedition2007.blogspot.com/>

The last site above is my old blog site for our expedition to Jamaica. It was a complete failure, thanks to the TSA agent who broke my radio. There are pictures of the radio that I took, a compact HF rig that runs off batteries, or AC power (with the right power supply). There are also pictures of the antenna and power supply as well. The antenna was made from PVC pipe and aluminum arrows that were cut to length along with some coils I added to shorten the elements of the antenna to a convenient length. The tests at home went very well and we operated the rig from batteries, solar panels, AC power supply and were able to rotate the antenna by hand and make it someone directional to get signals from Canada or Europe.

The rig got dropped, thrown, or slammed around by the TSA agents looking through my bags and thus it didn't work properly when we arrived but now the rig works again. It worked in the back yard in an emergency set up with a solar panel, and car battery. I was able to power it on the edge of the Caribbean Sea with power pulled from a bar and the antenna set up out on a concrete pier. Unfortunately, I didn't take a tool set with me and the local hotel maintenance fellows couldn't come up with the right tools either so I couldn't repair it on-site.

Had it not been for the fact that circuit boards were knocked off their connections by the TSA dropping the radio, we would have easily been able to communicate with the US and Europe from that location on what would have essentially been emergency operations.

11) How can I protect my electronic equipment like a laptop, shortwave, or even an iPod (I want my music in the Aftermath!)?

You need a “Faraday Cage”. Without going into the scientific explanation of how a faraday cage works, we’ll just explain what it is. Essentially it is a closed container made of either metal or metal mesh on a wooden frame where all the sides are electrically bonded together. Contrary to what some so-called “experts” say, a faraday cage does NOT have to be grounded unless you’re concerned about RF getting out of the cage or into the cage.

An EMP by its nature cuts across the walls of the cage and cancels itself out. Radio waves can penetrate the cage however, depending on the side of the cage walls, the mesh size, the bonding properties and so forth. But the signal will be greatly attenuated (made smaller) and should not cause damage to your radio equipment.

Walls and shields for special security facilities on military and government bases do ground the cages for “TEMPEST” requirements, to prevent RF from escaping and giving an adversary the opportunity to gather data from stray electrical fields. So if you’re trying to protect a small set of equipment, you can use a microwave oven (preferably one not plugged into the wall and operational) to protect that gear. A laptop, handheld radio, small shortwave, and or tablet computer and perhaps your thumb drives would be safe inside from EMP.

If you are concerned, you can still ground the box but it really won’t make much difference.

The difference in EMP and RF is that while they both contain elements of electromagnetics and electrostatics, a radio wave is an alternating current form whereas an electromagnetic pulse is precisely that, a pulse of a given amplitude that does not vary in polarity, merely amplitude. (It gets smaller as it decays).

The best protection for radios and systems in your house is to disconnect the power from the wall; disconnect your antenna from the radio. If you can, ground the antenna to a ground that will direct any induced current off the antenna into the earth.

12) If you have a HAM license, could the government call you one day, and force you – under penalty of the law – to set up, operate, man, etc. a HAM radio? Does the government have the ability to do this?

Not precisely. They ask us to volunteer. Any ham worth his salt usually will.

But... depends on the circumstances. I would say that would never happen.

There is nothing in the regulations that require you to do anything because the government orders you to do so. They can require us NOT to transmit on certain frequencies during times of emergency, and lately that has become a routine thing with the earth quakes, tsunamis and other natural disasters that have occurred. Basically they blank out a set of two-three frequencies for the use of rescue and health and welfare traffic, emergency traffic, etc.

But, consider in this vein. Would you force someone to do such a job if you knew it would make them hostile to you, where they could conceivably throw a monkey wrench in the works, gain intelligence on frequency usage, and sensitive information? I think not...

The ham radio service is covered under FCC rules part 97.

There once was a rumor (and I repeat it was a rumor only) that the government was planning to come in and seize equipment during any kind of national insurrection. While that was a rumor – in real life, it could happen I suppose. Do they have the authority to do so? No – they do not at all have such authority. Ability, perhaps depending on the amount of propaganda they put out. Then again, as a law abiding gun owner, do you have the ability to carry a gun in New York City? No, you don't because of local gun laws. Doesn't make it right, but doesn't prevent them from doing what they want.

13) If I'm traveling and quite a ways from home, can I use a HAM repeater nearby, or do I need an access code or something? Also, how do I find HAM repeaters while traveling?

You can use pretty much any repeater across the country. Almost all are open repeaters; some require an access code though for members of their local ham club or something similar.

There is a ARRL pub called a "Repeater Directory" comes out once per year with updated, national and international frequencies for repeaters on pretty much every band. That takes care of using and finding them. There is also at least one android app for your tablet or computer (phone, etc, perhaps iPad) to let you look up local repeaters with wifi access (and GPS).

14) If I do hit a repeater with a radio signal, is there a way to know I've done so? (Basically this question is asking how will I know the repeater is live.)

Most repeaters, not all, will transmit when you "wake them up".

As you un-key your handheld radio or microphone you will usually hear the repeater still transmitting a carrier signal.

Note that most repeaters these days use a tone coded signal (called CTCSS or Continuous Tone-Coded Squelch System).

Basically this is a low frequency tone that rides in the background as modulation, somewhere from around 65-250 hertz. Your radio must be capable of transmitting those tones. That is something to look at when you buy a handheld radio. The radio you mentioned, the MT-1000 I think is capable. Those are programmed with a computer and you can program them for all sorts of things if I remember right.

Some repeaters you can "ker-chunk" – a term we use for keying your microphone without saying anything and then listening for the squelch tail of the repeater coming back. This is not actually "legal" to do. You are supposed to transmit identification if you do this and not "broadcast" a non-intelligent signal.

Most people ignore that rule though, sad but true.

15) Why would someone use an EMP against us?

It's the easiest thing to do by a foreign power to really, really foul us up, without killing us all. An electromagnetic pulse will take out our computers, cell phones, internet, televisions, cable, and even our power grid. If you take down the technology of a society, remove their communications, stop them from getting help, destroy their military's ability to defend or go on the offensive, you can easily invade and take over the country, the land and enslave the people.

After all, if you were a military leader, would you simply want to kill everyone? You've got all those bodies to clean up, infrastructure you'd have to rebuild after the nukes hit it and cleaning all that radiation up won't be a breeze either. If you could simply shut down a country's ability to defend itself you would have a severe advantage when you came in with military "clean up" forces wouldn't you?

Your computers are the most susceptible, but if someone detonates a multi-megaton nuke above the atmosphere, it won't matter a whole lot because the internet will simply cease-to-be and your computer won't connect to anything anyway. It might still work locally if you have power, but unless you have survival manuals, address, or whatever you need to get off the PC, it's really going to be a pile of junk after EMP.

Phones will cease functioning. Handheld radios, computers and even your iPod will quit. Many cars will no longer work either – computers and computerized fuel injection systems would be junked.

Protect your communications equipment. You might need it sooner than you think in the near future.

Basic Survival Skills

What is survival?

Survival is not taken for granted but actively achieved. A survival mindset is one of the main tools for staying alive. Knowledge is secondary to having a will to live. But knowledge will, hands-down, keep you alive if you correctly and with common sense apply that knowledge appropriately.

A bag of tools, shiny weapons, nice knives, packs of food, gallons of water are only going to get you so far when thrown into a survival situation and may actually become a liability under certain circumstances like carrying too much, trying to go too far, with too little food and water. While they certainly can and will turn the tide in your favor, give you a leg up on others around you, and perhaps see you through to the end your most important tool is your brain. Your second most important tool is your will to live. Finally your third most important tool is knowledge of how to find and purify water, build an impromptu shelter (and a more permanent one later if you're stuck on the proverbial "Desert Island Scenario") and how to catch and kill animals for food – and to survive against the most dangerous predator on the planet.... Man.

In truth, if you've ever read "survival stories" (and you should) you will realize that 99% of all survival stories start out on a nice day in the park and wind up as a blizzard in the mountains, a floating board in the ocean or a fall down a hole into a cave (or something equally absurd) and none of the "victims" (or Survivors) even had a pocket knife to their names. Therein lies the issue; Preparation.

Preparation is the one thing you can do for yourself to include education, training on your "tools" and various survival skills to give yourself that "edge" you need against Mother Nature – or predators.

If you learn a few skills, say, how to use a map and compass, how to throw together a shelter for the night, how to locate and clean water, how to start a fire with sticks (and/or your shoelaces) and perhaps how to use a "Rabbit Stick" you give yourself a fighting chance to make it to the next day if you're suddenly in a bad situation.

Don't forget, there's wilderness survival, and there's "Urban Survival".

You can mitigate a few problems by carrying some "everyday carry items", say a simple pocket knife, or perhaps a firearm if possible (some regions deem it illegal....), some simple tools like string or rope, extra clothing and so forth. If you drive in the city, keep a backpack to get you home if you have to walk. I keep a bicycle handy these days to get me home, and a walking stick, as well as a backpack with food, water, a knife and a few other handy items. But I live in a town, travel to the country for work and have a 40+ mile round trip to make. The family knows this and knows that if communications goes down I'll get home one way or another. Might take me a few hours, but I will. I have alternate communications as well – Amateur Radio for one (in case cell phones cease functioning).

There are so many options we can't cover them all. These pages are for BASIC information such as finding water, protecting yourself against nuclear war (assuming you're not at ground zero), finding food, getting home, escaping from bad guys, preparing and surviving a blizzard, flood, earthquakes or storms. There is

nothing fancy here, just the very basics. Keep that in mind and as you read, study the simple stuff. Don't go for the big, heavy back packs and shiny guns, long knives and super-duper survival kits until you're sure you have the basics down.

Keep it simple, have a plan, use common sense, use your knowledge and you'll be fine. You will find you don't need to pack in 60 pounds of junk in a back pack for a survival practice. That's right, go camping with a minimum of food, water and items. Put into practice what you're trying to learn. Start a fire using what you find in the woods. Build a shelter from the natural material around you. Carry what you will need to prevent getting wet when it rains, and enough food to get you in and out. Carry a manual to identify plants you can eat. Do the easy stuff first. Learn it well as a foundation for everything to come later.

Survival Education

As a former teacher I would say that our greatest strengths as “survivalists” would be education. If you can’t read well, it is difficult to learn – as I’ve shown some of the children and grandchildren. Occasionally you get a tough kid who says “I don’t NEED to read” or “I don’t care about history because it has nothing do with being a _____” – and you can fill in the blank with whatever idea they have in mind.

For those of us who managed to get through high school and on to college though we have come to realize that education isn’t something that ends when you get a diploma, degree or just finish some course work.

Education is an on-going process that we each must take seriously and continue to learn, even after we’ve become experts in our respective careers or jobs and where this comes to have the greatest impact on ourselves and those around us is not at our jobs.

It is when you are pressed into service to do something above and beyond the normal call of duty. In this case I’m talking about what happens when the proverbial balloon goes up, the shit hits the fan, “The End of the World as we know it” situations – or simple emergency situations that might occur at any point of any day of the week.

For my last 25 years I’ve tried very hard to pass on what little I know about anything and everything. Some of my friends and readers are aware of what I’ve done, and what I’ve tried to contribute back to this community. Some are not or don’t care.

At this point in my life my focus on education has been my future as a pilot of a ship, navigation, weather, astronomy, ocean and wind currents (Earth Sciences) and other things related to getting myself, my wife and our boat from point A to Point B. The more I have learned the more I realize I will never know everything and experience it seems is usually the best teacher.

The world is in turmoil in a fashion greater than anything I can recall from the past – and with the possible exception of the Cuba Missile Crisis I can’t remember when so much nonsense around the world was affecting America directly.

We have an infrastructure in place in America that would be difficult to topple, and yet, so did the Soviet Union in its time and it certainly fell. The forces of Capitalism and Democracy managed to cause the Soviet Union to crash and burn. And now they are fighting hard to return to the power they had in the last century. They won’t stop until America is in ashes.

Therefore it behooves each of you to learn as much as you can, and understand not only local politics but those of America, and even systems which are foreign. Sun Tzu, to paraphrase him said to know the enemy is to be able to defeat him.

But more important to each of us is the ability to survive and even thrive in the face of adversity. Without survival any knowledge you have cannot be imparted to the next generation and the next generation becomes dependent upon the current “social interaction” and of course we can all see what that means by looking at those around us who’ve been brainwashed by the media, Leftist thinking and Facebook Drama.

I would urge all of you to take seriously the collection of data, information and education yourselves so you can educate others. You may not be able to change the minds of all the younger generation, but if you can change one or two, and they in turn can eventually change another one or two, at least we can keep alive the dreams of what America is supposed to be – not the image of what the Left wants to remake America into.

Let's go back to education for another look. I'm not suggesting you study political science but perhaps to at least get a grasp of what the other side says. I'm not suggesting you need to be able to predict the weather, or to be able to plot a course across the ocean, or even understand how a radio works.... but when it comes to "survival" every, single skill, no matter how innocuous or silly it might seem is a piece of knowledge you carry around in your head – something you can use at some point.

Remember all those times we thought, "Algebra? I'll never use that crap in real life!"

Well, I for one was wrong, not only have I used algebra (and use it nearly daily), I use trigonometry and geometry a lot more than I ever used to.

I suppose this is a final plea from me to each of you to inspect your own personal lives, consider the path this country is taking and understand that if you do not have knowledge of certain things that soon enough that knowledge might be denied to you by the powers that be.

The internet has a lot of resources – and we all know this. I think it is time to use them. Spend an hour per day learning something new, something to help you survive in emergencies and you won't go wrong and then practice those new skills so you know you can do them.

—

I started these short articles some time back with the idea I'd post some "education ideas" for everyone.

I've been carried away with several life issues. In the last eighteen months I've lost my little sister, my Father, and a half a dozen friends. (2011-2013)

A few months back I had my own personal scare. A routine (and I emphasize the word ROUTINE) EKG was performed and my doctor advised me it appeared I'd had a heart attack. I don't REMEMBER having one, but I took it seriously. I underwent blood tests (results were not back yet at time of the original writing - **I did NOT have a heart attack, it was a misdiagnosis**) and then on the following Tuesday I underwent a stress test.

The odd thing about the testing was the doctor performing the test thought I was "there for a reason" – that is, something had occurred and they were simply ensuring what the damage was. A bit of miscommunication I'm sure on the doctors' parts.

When the test was over the doc examining me, was looking over my ultrasound and new EKG could find "nothing wrong" except for something was bothering him. He made a kind of off-the-cuff diagnosis stating I had "aortic stenosis",

which is more accurately called “Aortic Valve Stenosis” – a narrowing of the valve on the left ventricle of the heart into the aorta.

Call me cautious, call me paranoid, call me untrusting... whatever you want to call me, but I didn't believe the doctor at this point. My pointed questions to him brought some confusion on his part as to his “diagnosis” because he couldn't answer all my questions.

In fact, I asked him about it not really knowing exactly what causes this condition – at the time, and now I know as much as a layman might know about it given a few days of study – and his answers were less than satisfactory.

His “advice” was that I am GOING to require open heart surgery and a valve replacement “soon”. He couldn't give me any time frame, but I believe he was trying to tell me that my world cruise was going to have to be cut short.

A new test, a C-T scan was set up for the following week on the aorta, bicuspid and tricuspid valves to look for aneurism and ascertain the quantity of calcification on the valve (if any). The fact is I have had a kind of “heart murmur” since I was a child and one of the indications of this condition is when you have one from being a child....

Anyway – calcification can be reversed with the proper diet and vitamins. I didn't know it when I asked the question, “Can I reverse this, through diet, exercise or medications”. His answer was an emphatic “NO!”

Again, not one to trust the medical establishment outright, I started researching and found that yes indeed there IS evidence such a condition can be reversed.

(Not going into the details at this time, but it's a combination of certain vitamins to ensure that calcium is properly absorbed into the body, more than one vitamin, along with exercise, proper diet etc).

Why are telling me all this?

Here's why I'm telling you this. I had a pretty good scare. It raised my blood pressure. I have had anxiety attacks over this and actually discovered myself becoming depressed thinking how I wouldn't be able to put my five years of planning and preparation into effect. I was thinking “What will my wife do?” and all sorts of other stupid things. Of course, she will get along fine, I'm sure, without me and she might even miss me some!

But why worry when you can't control the outcome? Well... perhaps I CAN control the outcome – and that my friends, is precisely what “Survival” is all about. A state of MIND!

I don't think anyone should “give up” and go with what anyone tells them and accept the outcome someone else thinks is what is going to happen. Do things for yourself. You might have some disease that will kill you, but you know what? Live your life as best as you can, examine what you haven't done and do it. Go through your options and try new things, perhaps other methods of treatment. But don't go down without a fight. That is true human nature.

All of this is part of the survival mentality for me... including refocusing depression into something more helpful like studying up on the condition. As it turns

out, I am sure my problem is related to calcium intake.

How can I be so sure? Heart burn, I get it a lot. I used to take calcium carbonate to stave off heart burn.

If you take too much you can literally poison yourself.

Duh.... Of course you can. Not knowing that messed me up pretty badly and I didn't even know why. So I studied it, and I understand it now. It also caused me to eat less, stay away from things that will give me heart burn (no matter how little I take in) and to take better care of my body.

Other symptoms of over dosing on (or more accurately too much intake of) calcium (hypercalcemia) includes the following:

Nausea, vomiting, loss of appetite, abdominal pain, dry mouth, thirst, constipation and frequent urination along with muscle weakness, pain and twitching or joint pain may also occur. The level of calcium in your blood does not necessarily relate to the level of symptoms. Symptoms will differ from person to person.

Funny thing is I didn't know this stuff... and I was taking way too much calcium carbonate into my system, and I have had most of those symptoms. In particular "joint pain"... hips, shoulders, elbows, etc. Major pain can occur just trying to stand up from squatting down to pick something up.

I had stopped taking any of this stuff because I was "aware" of the joint pain and possible connection.

Over the course of a week I learned more about heart disease than I want to know, but I am sure now that whatever slight condition I have would be exacerbated if I continued to take in too much calcium – and if I listened to a doctor tell me there is no cure, no reversal, stop exercising and don't worry about my diet. Pretty much what he told me to do is "prepare to have open heart surgery!"

I think not.

I went through the C-T scan, as a precaution and a confirmation one way or another, and to satisfy myself about my "condition". It was completed and a day or so later my doctor called to tell me that "No problems were found. Come in for a checkup and physical next year." And I will.

Either way – I'm completing the plans to go sailing, to cruise... and if perchance to die, then I will do in my own time without some doctor forcing me into a screwed up medical system, pig's valves or mechanical valves (both of which have their very DOWN sides including the types of medications you have to take and remain tied to the medical system).

And by the same token I'm sharing this story with you all so you can stop and consider something important.

Our lives are fleeting on this planet. We've all probably lost someone close to us, knowing they were likely not 'finished' with their 'life's work' or didn't accomplish those things they wanted most. Do not let this happen to you!

Continuing Education

All of us are in the same boat and we all have things to do, plan and accomplish and letting death get in the way of life is not something any of us ought to

do.

All survivalists are on the same page; remaining alive when all others around you have likely lost hope, or put their hope into something (the government for instance) and not in themselves and their own brains, or they are already dead.

We all want to keep going, keep living, and sometimes against extreme odds people survive things that would kill a lesser person (and at times a stronger person!) – A person who does not have that will to go on, to survive and to make it out alive.

We all know we won't make it out of life, alive... but we can extend our lives by planning, training, education and understanding, avoiding being in the wrong place at the wrong time. There are just times when it's "our time" and nothing on Earth will save us but we must meet that fate with courage, honor and the conviction that we tried our best.

With that my friends, I'll give a final piece of advice.

Educate yourselves. Take a couple of hours per week to learn some new skill, whether it is starting a fire without normal fire starting materials for instance. Learn to clean and purify water without the use of fire and using fire. Learn how to tie various knots (to help put up shelter for instance), learn to row a boat, fish, swim, exercise, identify plants. Anything you teach yourselves, no matter how small and insignificant is something that might just extend your life by another day.

Thus I provide the meager messages and pages I've provided in this basic manual. If they do nothing other than make you think a little differently about how to do things, where to go for help, learning new skills then I've done nothing other than my intention; to help others. Enjoy these pages, and enjoy the days you have ahead of you.

Survival Skills

There are a thousand different kinds of scenarios one might find themselves in fighting for their life just to survive the situation. There are a thousand other circumstances that might take days or weeks to kill a person, but still they will be in a survival situation.

No one can know precisely what situation they might find themselves in, unless they are planning a trip through the jungle down the Amazon River, a hike up a mountain, white water rafting or some other planned event that takes a turn for the worse.

Those people can (and do, usually) take the time to study what sort of surroundings will exist when they arrive, what can go wrong, what probably will go wrong and they plan ahead to mitigate problems. In life threatening situations they will most likely have the right clothing, the ability to signal for outside help, a contingency plan in case everything falls apart and maybe even a backup team to assist with supplies or safety gear.

Even a simple day hike can quickly go very wrong if you twist an ankle with the weather turning bad, with the wrong clothing and no easy way down the mountain. You normally don't have a planned escape route, support team, extra rations, a GPS, and a helicopter standing by for a day hike though, and who would want to?

But in this case you certainly, we hope, take the time to think through your hike, what can go wrong, what you can do to prevent things from going wrong and in the off chance something doesn't go the way you expect you have a contingency plan to extricate yourself from your emergency. This is generally not the way people set out for a fun weekend hiking in the mountains though. Preparing though, should become second nature to you.

This is all about planning ahead. It all goes back to the "survival attitude" or "survival mentality" you should develop. Many people simply skip this step for a day trip to the mountains or forest. You should not. If you think things through each time you will prevent almost every possibly disaster you could imagine by simple planning. This is your most important "Survival Skill". Thinking about what you're going to do today.

Some skills you might need in the woods or on a hike up the mountain might include map reading, compass use, land navigation, active weather observation, plant and animal identification, recognizing human and animal trails and maybe how to use a knife. (You carry a pocket knife right? Is it sharp? Do you know how to use it for anything?)

What is a skill? A skill is simply the ability to do something to accomplish a task. We each, literally, have thousands or tens of thousands of skills. Each thing you do, you can break down into a skill set. Each set of skills is an individual item. An example might be sewing a button onto a shirt. Most of us has an idea how to do so, albeit perhaps not very professionally. We know we need a button, a needle, thread, a shirt and we have to do things like 1) thread the needle, 2) line up the button where you want it. Threading a needle is a skill. Lining up the button is a skill. Together, those things make a skill set.

Reading a compass is a skill. Knowing what to do with the number you get from the compass, in conjunction with a map or chart is a skill. Navigating to a distant mountain range using the compass and map combines several skills. Navigating across an ocean with a compass and sextant require similar, but different skills. Again, navigation becomes a skill set.

Every single situation you specifically place yourself into that could possibly turn bad also has a specific “skill set” you should know. Many of the skills will be useful in more than one situation, and used in different skill sets. Tying knots can be used in sewing, sailing, camping, mountain climbing, hiking, building a shelter and so forth. Various knots would be used for different outcomes. But knot tying is used in all those conditions.

Occasionally, you will find yourself in a situation where you need a particular skill set that you know nothing about. Assuming you survive your situation, study should be on your mind.

Over the years I've compiled a few lists for my own use of “necessary survival skills” based on the various situations I've put myself into or found myself (sometimes unwittingly). Things like locating water, fire starting or building a shelter translate too many situations such as hunting, fishing, hiking, trail riding, horseback riding, mountain climbing, four-wheeling, white water rafting, sailing and boating, and canoeing. I'm not going to go through and list every single skill I've ever decided was useful in particular situations, but will list a few important skills that might be used in several situations and that you can teach yourself assuming you don't already have them.

I consider all of these (I will provide a listing) to be basic skills. All Basic skills can be self-taught and practiced in your backyard, nearby woods, or just at home. None of these should be anything too difficult for 90% of everyone to learn and once you have a decent grasp of them, teach them to someone else. The children, grandchildren, neighbor kids, Boy/Girl Scouts, neighbor, spouse... anyone who will listen. You should do this to help others ensure their own survival, to ensure the skills are passed on and to just practice your own skills.

Sometimes, however, the act of teaching isn't to gather a group, but to simply do something in a way that is different than others might have observed previously. Eliciting questions about something “unusual” usually results in a better retention of the material than forcing training upon people who aren't interested in the first place. For example, starting a fire in your backyard fire pit with a fire bow, instead of using a lighter or matches might induce interest, especially in children.

Remember – Survival as stated before in other places is **a state of mind, an attitude**. It's not a box of canned food, a barrel of water, a rifle, knife or collection of things. It's what is in your mind. All those other things are tools, and food and water are useful and will keep you alive. But knowing about those tools, food, and water is education, and education is knowledge.

Knowledge is power over your environment – and others when necessary.

The list below is in no particular order. These are various skills that we have learned, or used at one time or another, either in real training (Military), hunting, fishing, sailing, hiking and mountain climbing and I don't consider one to be more

important than any other. They are all useful; some are useful in only certain conditions but should still be a personally known, practiced skill by each person. And I haven't listed everything I know or have tried.

With a knife, in the woods alone, you can use these skills and survive for a night or a month. I will cover five very basic things in greater depth; fire, shelter, food/water, signaling and first aid. Other skills are covered in much greater depth in survival manuals and these things are beyond the scope of this small book. Remember, we are mentioning this to give you some ideas to work on yourself.

Basic Survival Skills List

- Creating a shelter (one night or long term)
- Obtaining water (and purifying)
- Starting a fire (and how to keep it going)
- Self-defense (personal and protection of others)
- Finding edible food sources
- Nutrition
- Maintaining your body temperature
- Knot tying
- Forecasting weather
- Disposal of waste and sanitation
- Hiding, escape and evasion
- Tracking – Recognizing dangerous animals and food sources
- Hunting – by various means
- Fishing – by various means
- Navigation (various terrains like land, water, mountains etc)
- Psychology (yes, understanding what the OTHERS will do!)
- Personal motivation, survival mentality – why keep going?
- Planning for the worst – hope for the best
- Expect the unexpected
- CPR/AED
- Basic First Aid skills

Let me talk a moment about some (not all) of the above listed skills.

Shelter

Obviously knowing these skills cannot be used in all situations is simply common sense. We wouldn't expect to have to build a shelter in a city – unless the city is some post-Armageddon type place. We likely won't have to find water if you're living at home, have running water or in the middle of an airport. And you likely wouldn't necessarily want to build a fire in the middle of a baseball stadium. Though I've been in airports without water, and we've had problems with the city water system, and I've been caught in nasty snow storms in a city before.

These are a list of basic skills that I've come up with myself and have either used them, practiced them for some good reason or understood that I would be a position at some point having a need and ability to do each. I'll try to break these each down just a bit – leaving the details of where and how to learn them to you. There are plenty of books, web sites, and survival manuals to explain many of them. Most you will need to practice a few times to “get them right”. Some you learn and “forget” until needed. Some you might need to practice daily, weekly, monthly or yearly.

Creating a shelter (one night or long term)

Obviously we can't cover every possible situation, type of environment or weather conditions here, but a basic shelter needs to provide protection.

A shelter should protect you from rain, or dampness. It should provide shade in hot climates. It may (or may not) be required to give you some protection from dangerous animals. It should get you off the ground in damp areas, and away from dangerous insects like army ants, crabs on beaches, snakes, spiders and scorpions in the desert areas.

If you're stuck in the woods, on a mountain, have survived a plane crash or a shipwreck you might require a shelter. If you get lost on a day hike, or it starts snowing when you're out camping deep in the woods or hunting out there, you might find yourself needing a shelter.

Depending on the terrain, circumstances and conditions there are many types of shelters. If you're prepared ahead of time, you might have a tent, or camper. Good for you. But you might have to make do with the things around you.

Why you need shelter is the most important question.

Exposure and dehydration kills more "survivors" than any other problem encountered. If you're caught in a sudden downpour and get soaked to the skin you're likely to get hypothermia. If you're caught in a sudden snow storm you're going to get tired, sweaty and sweat equals death by hypothermia. A quick lean-to can put you out of direct wind, rain, snow and cold.

Building a shelter should be on the top of your list of survival abilities and list of "to-do" things in a survival situation in the woods or outdoors. Using a knife, knot tying and understanding what plants, trees, leaves and items you can use in your given environment are skill sets you should have.

Obtaining water (and purifying)

Dehydration is one of the leading causes of death in any exposure situation. Finding water is important because you can live a couple of weeks without food in most cases. You can only live a few hours in a desert, perhaps two days. You can generally live without any fluid intake for 3-5 days. After that, your body will begin to shut down, blood stream will thicken and your organs will fail. In short, get water or you WILL die.

Finding and getting water should be very high on your list, probably second after a shelter.

Knowing the environment, how to locate water and being able to get the water from the environment are important skills. Survival manuals give you more details than we have space available in this manual.

Starting a fire (and how to keep it going)

Being able to start a fire with practically nothing in your pockets is a skill that may save you some day. There are several methods to make a fire with nothing but dry wood – commonly called by the lesser informed “rubbing two sticks together”. In truth having practiced several of these methods I can tell you from personal experience that none of them are EASY. All of them use friction to start a fire, and preparation before starting is as important as the materials you chose to use to start the fire in the first place.

The fire bow or hand drill method to me has been the easiest assuming I had a string or some sort of cording material to make one available to me.

The fire trough – a long board with a long groove in it, using a stick to rub in the groove is a tough way, but works.

Flint and steel – you can purchase and carry a small flint and steel fire starter which normally should be allowed on airplanes through security and so on. Finding such things in the woods is very difficult, but can be done. I carry one in my daily carry pack, I carry one in my airplane backpack, I carry a small one at home and I have several more available that I give to people who are out with me in the woods to use.

There are a dozen other ways to make fire using items you might carry like the latter, but making fire without man made materials is a difficult process for most – but it's because they don't practice.

You can Google the various methods and try them yourself, choose one that works for you and would be useful in many situations. Understand the other methods for situations where your chosen method won't work well.

At least know one method for starting a fire without matches and lighters. Personally, I would know two or three more using natural materials from your environment.

Maintaining your body temperature

High up on the list of survival skills, most of us practice this every day of our lives without really thinking about it. The types of clothing you chose on a daily basis, the predicted weather for the day (or weekend) usually dictates our clothing. Regardless of what you're wearing now, in twenty minutes when you find yourself escaping from a flood and soaked to the skin you're likely to want to be warmer, and drier.

How you accomplish that becomes the order of business for that moment in time.

Lost in the woods in a snowstorm might be a cold place to be, but, you will soon find yourself sweating in your clothing if you over do it. If you panic and run, if you start working too hard digging out your stuck SUV you will find that you will be sweating. Sweat equals Death. Hypothermia will set in. You are better off taking off all your clothing to dry your skin than letting your clothing become damp with sweat (as I have proven to myself on a couple of occasions)!

Not getting too hot in the summer time is another condition you must be aware about. Not being hydrated and working too hard in the heat can caused heat exhaustion and heat stroke. Heat stroke will kill you. Your body temperature gets too hot, and the blood flow can't remove enough heat from your brain. You literally over heat your brain and will die from this condition.

When you set out to climb a mountain or a day hike you plan your clothing around your trip. Don't forget a windbreaker or other lightweight outer cover to keep the wind off you. There are a lot of ways to plan for such trips. Getting caught with just the shirt on your back is a bad thing, but you can overcome if you think about it.

Dry leaves in the winter time stuffed into your clothing will give you insulation.

A damp tee shirt in the summer will cool you down.

You can read up on various ways to maintain your body temperate and come up with many more things than I have time and space to mention.

Finding edible food sources

This is a more difficult skill to have. It's also one that will come in handy in the woods, or on a deserted island.

However, there is one thing about this you should know. Many plants are edible. Most animals are as well.

If you learn nothing at all about this, learn how to determine if a plant is edible. Normally you find a source of what might be food, a plant of some kind. There are some steps to determine its usefulness as a food source.

They are:

1. Is there enough of the plant around you?
2. Break it open (fruits usually) and smell it.
3. If it smells like peaches, or almonds, don't eat it –**it is possibly poisonous.**
4. Next rub it on your skin, on the back of your hand or inside of the forearm and wait 30 minutes. If no effect then:
5. Touch it to your lip. Wait another 30 minutes. If no effect after 30 minutes then:
6. Touch it to your tongue. Wait yet another 30 minutes. If no effect then:
7. Chew up some of the plant or fruit – do NOT SWALLOW it.... And yet again, wait awhile, a reasonable amount of time. If there is NO EFFECT then...
8. You may chew up and swallow a small amount. Wait at least eight hours. If there is no effect, the food is probably OK to eat.

You are testing for several things here. You are looking for allergic reactions and reactions to any chemicals that might be in the plant. Some things in quantity can give you the runs, or cramps and you should avoid eating them. In fact, coconut milk in quantities can give you a bad case of the runs. Don't drink too much of it if you're stuck on a desert island!

You would do well to obtain a book on plants located in your region and learn them, identify them, and even try them out yourself in various meals once you are sure you can easily identify an edible plant. If you're going to another part of the world, then get a book on fish, animals or plant identification. These will help you later, especially if you can carry the book with you to help identify things while visiting. If you suddenly find yourself in a bad position, with no food, you will know what you can eat. One thing to consider when traveling to distant lands on vacation is to carry a book that helps you identify animals, plants and other things that could be helpful to you. I keep a Reef Fish identification book when I sail in the islands of the Caribbean. Many of them are poisonous and you don't want to eat them. You might never need the knowledge, but it's part of your "survival education" now!

Coupled with the ability to locate water that is safe to drink (or purify) you should be able to survive with no problems until rescue comes or you walk out under your own power.

Self-defense

This is a skill anyone can learn and there are literally a dozen different forms of self-defense, perhaps more. I won't detail any of this, but at the least you should learn to defend yourself against attack by one or more bad guys. If they have guns you might be in trouble. But if not, sometimes fighting is your only recourse.

As a trained sword fighter, I can literally pick up a decent stick and use it for defense – and offense. Not everyone can do this, but learning something about makeshift weapons, such as what you can bring to hand in a fight will assist in keeping you alive. There are entire treatises written on field expedient weapons; that is, weapons made from sticks, stones, bows and arrows, slings and slingshots.

Research this one yourself and see where you should go.

It isn't difficult to locate a stone, a stick and some cordage to make a type of a tomahawk. A long, straight staff as a walking stick can double as a quarter staff. Either of those two items can be made rather quickly in an impromptu manner in the woods or wilderness and both will give you an advantage over a large, dangerous animal such as a big cat. A grizzly bear, not so much, but most small creatures will not mess with an armed human being, including black bears, cougars (mountain lions) and most wild dogs.

Wild dogs, in a pack are more dangerous than a bear. If they are hungry they will work together to bring down a much larger prey than themselves. The author was once attacked by a pack of wild dogs in the Sahara desert and ended up killing one with a knife because he didn't have any other weapons. Some scratches were all we ended up with but it wasn't a fun situation to be in.

The dogs were coming from all directions and it took killing the "Alpha" dog that went for our throat. As stated, it was not a good situation to have either gotten into, or to get away. The best thing possible is to avoid being in such areas, but sometimes you cannot pick your circumstances (and in that case, neither could the author).

Nutrition

This is a daily life skill. Most of us have no idea what nutrition is really about. But simply put it is eating a balanced diet. The right amount of carbohydrates and sugars, animal or vegetable proteins, vitamins and minerals.

There are massive tomes written on this subject. Knowing what to eat day in and day out is not easy to learn in the first place and putting it into practice in a survival situation where protein and edible plants might be difficult to come by in the first place makes this one of the more “difficult skills” to know.

But if you take the time simply to understand what a good, daily requirement would be and start eating right in the first place (to keep your weight where it should be, your strength up, your health in general good and combined with exercise) you should do fine.

When you get hungry you will figure out eventually what your body needs assuming you can keep your strength up in the first place.

This is not a skill I personally “practice” in the woods or camping, hiking or hunting. I make sure I have the right foods with me, know what I can and can’t eat out of the woods and go from there. The main thing to take from this skill is that you need certain things to keep going.

You need carbohydrates for immediate energy. You require protein to continue body repairs if injured and also in place of “no fats” in your body. Fats provide around one half of the body’s stored energy. Animals can provide plenty of protein and fats.

Plants provide vitamins and minerals your body requires. A survival situation will force your body into using stored fat and energy requiring you to replace it or tire and weaken quickly.

It’s a fair bet that you won’t find any “Government” list of foods that are good for you, the “food groups” won’t be growing on a tree someplace and the chance you’re going to kill animals with nothing but your bare hands are pretty remote. So, considering the best course of action for any given place (woods, forest, mountains, island and so forth) are really something you should do well ahead of your planned stay.

If you are suddenly thrust into a bad position like a plane crash or a shipwreck, general knowledge is usually more helpful than regionally specific information. So consider some general knowledge on nutrition.

Knot tying

Since cavemen first figured out they could use a vine or plant to make a knot, to tie things together to more modern things like sailor marlingspike (also called “marlinspike”) skills, knots have been around a very, very long time. Knot tying can be as simple as a simple overhand knot to something much more complex like a sheet bend, bowline or a granny knot.

Why know knots (why no knots)? It’s more about why should you know which knots, than why know how to tie a knot. Anyone can tie a simple knot like a granny knot or a square knot (also known as a reef knot in sailing). A sheet bend is the sort of knot used to create fishing net. A bowline is used for several reasons on a ship. You might know two or three knots now, but do you know when and how to use them?

Maybe not, a lot of people only know a couple of helpful knots in their daily use and don’t know special knots for use, say on a yacht. Our crew has to learn several types of knots and know how to use them for the correct situations. That’s OK, that’s what education is all about. You might tie a knot and find out you can’t easily untie the darned thing and you need to reuse your line! This can lead to a dangerous situation (say on a boat battling a storm, trying to take down a tent in a heavy breeze, or on the side of a mountain trying to get down).

There are some books available to teach you knot tying, and you can certainly use Google to locate information on what kind of knots to use when.

But you will find that sometimes you do not have string, rope or any other binding material at hand to use in a survival situation. That’s where using natural materials like vines or makeshift cordage comes into play and then tying the right knot will become more important than you can even imagine right now.

Six knots you should know, and when to use them and which situations are best for them are as follows:

- Square or Reef knot
- Bowline
- Slip knot
- Sheet bend
- Figure Eight knot
- Clove Hitch

Each of these knots is useful in a different situation where any of the others would not work or would fail. I’ll leave it up to you to research them and figure them out.

Tracking – Recognizing dangerous animals and food sources

Tracking involves identifying footprints and spoor of animals. Simple tracking involves the identification of animals that are potential food sources.

Hunting and Fishing – by various means

Hunting and fishing by themselves are two subjects that many hundreds if not thousands of grand tomes have been written and this author can do no justice to those subjects.

In one fell swoop I'll cover these very simply.

Personally, I'm a pretty lousy fisherman when it comes to using a fishing rod and reel and lures. In short, I'll starve if I have to depend on that method for fishing.

Spearing them, catching them in a net, dynamite or electricity is my preferred method of catching fish.

But I'm sure most folks can figure out that you can catch a fish with some simple methods. Various survival manuals, in particular the US Air Force Survival Manual and the SAS Survival Manual each have several methods of catching fish, from making nets to trot lines, to building fences to catch them in. I strongly recommend these books for folks who are completely ignorant of the subject, and are just "starting out". Of course, these are survival manuals and in many cases you won't be able to legally put into practice some of the methods in the books.

Even if you're in a place where you can catch fish in the first place you're probably not going to get a lot of fish most of the time, but anything is better than nothing. If you have no equipment at all, you're going to have to create makeshift methods to catch or spear fish. This might include hooks, spears, bow and arrow, even line.

As far as hunting goes small game is easier (sometimes) to get than larger game. A rabbit or squirrel will feed you for the evening, perhaps two evenings, most of the time, but you'll need a few for a group. You should also be aware of the season when you're catching these animals because they can carry some diseases. Taking a rabbit or a squirrel is easiest if you set up some snares. A "rabbit stick" can be used to knock them down and kill them as well, but this takes some practice. Field expedient bows and arrows can take down a rabbit or squirrel, again, practice makes perfect. Making a bow is a difficult skill to learn, but a good one to have. Of course, making a bow becomes a "skill set" because you have to make arrows, fletch them, point them, make a bow string, the bow itself and then be able to shoot the contraption and hit your target!

Taking down a deer, buffalo or a cow will obviously be much more difficult and I wouldn't try a buffalo unless I was absolutely certain of my aim and my bow and arrows. (Note: I've walked through a wild life refuge in Oklahoma back in the 1970s, through a herd of buffalo. It was one of the stupidest things I've ever done in my life and I won't repeat getting close to a full sized male buffalo again if I don't have to!)

Tracking

Tracking is something that takes years to learn properly, but you can pick up some very basics, including identification of tracks from books. Tracking larger creatures is immensely easier than tracking smaller creatures. However, most animals create their own paths in the woods and they continue to use those paths consistently leaving animal trails that are easily spotted if you know what to look for. (And many times, these become hunting places for knowing hunters!)

Finding animal spoor is not as difficult as you might think, if you know what to look for, and where to look. Tracks are harder to spot in a woods setting than on a beach. But tracking those animals to a place where you might be able to catch, trap or kill one will be exceedingly difficult for most people, me included.

What tracking does for you though is to confirm the type of animal you're after, locate its trails and allows you to set up snares for smaller animals, traps for bigger ones or even a hunting blind. On a good day, it will get you in a position to kill a larger animal for a good quantity of protein.

The other thing tracking will do for you is help you identify dangerous animals you want to stay away from like buffalo, big cats, some kinds of pigs and in foreign lands, elephants, rhinos and wildebeests!

Hunting goes along with tracking. Tracking gets you near the animals. Hunting puts you face to face with the beast you're after.

I cannot recommend getting all your hunting skills from a book. I can't recommend you going out and testing your personal skills against nature either. I DO recommend you GO with an experienced hunter (if you're not already a hunter which I suspect many readers will already be – and this is one of the reasons I will not elaborate more on things like hunting, fishing and tracking. There are many more who are much more knowledgeable about these subjects than I am).

But, if you think you will ever be in a position where hunting will be an important survival skill, certainly learn what you can and put it into practice before the Aftermath.

For the record, hunting doesn't just including finding and killing an animal for food. It includes how to skin and clean, butcher and use the animal remains! This also includes (under normal circumstances) taking care of the environment to the best of your ability. In a survival situation, pretty much anything goes. (In our day, as young people, this was called "Conservation". Now everyone wants to call it "Environmentalism". In my opinion, the one is good, the other is evil.)

Forecasting Weather

Forecasting weather isn't as difficult as many believe. Certainly there are meteorologists who go to college for years to learn how. But weather prediction is based on wind and cloud patterns for the most part and people have been predicting weather a few hours to a day or two out for centuries. You only gain this sort of knowledge by examining cloud structure, wind patterns and knowing what went before today to know what tomorrow will bring.

In other words, this is a "difficult" skill requiring some basic knowledge of the region where you live, knowing the weather patterns and studying them ahead of time to be able to predict anything with accuracy. This one will require some study, careful observation, thinking and good guess work at first. Pick up a book or read on the Internet on cloud patterns and what they bring. This will get you started. Keep a log book for your area on a daily basis. If you have access to simple things like a barometer, thermometer and wind indicator (telling you where the wind is blowing from) record this information and watch for patterns.

When you see "Mare's Tails" or Cirrus clouds, what happens in the next 24-48 hours (probably a low pressure system or cold front, or both) will eventually become self-taught knowledge and you will surprise yourself about how accurate you can be. Knowing this sort of information can give you a leg up on the other hunters out there knowing when it is going to rain or snow, and when the deer will be bedding down or moving around!

As you can see, many "survival skills" are translating into other daily use skills. Daily use skills translate into survival skills too.

Disposal of Waste and Sanitation

This is a daily use skill. When you're in the woods, you basically have to learn to shit in the woods. Some folks don't know how. There's even a book written on the subject.

But this is very important in a survival situation where there are more people than just you. In flooding and quakes and other natural disasters, the normal public utilities go away. Toilets don't work. Electricity doesn't function. Waste material can quickly overcome what meager amounts of water are available in such cases and preventing bacterial infection can save your life.

Knowing how to dig and set up a latrine can save everyone involved.

This is a skill that you should learn even if you never have to use it just so you understand the dangers of various communicable diseases present in natural disasters and how people catch them.

Waste disposal doesn't just include human or animal waste. It might include burying the dead, either humans or animals. Nothing something any of us want to have to do but depending on the circumstances you might be called upon to be a community leader and your knowledge of this might assist you in keeping not only yourself, but others alive and safe from diseases.

Basic First Aid skills – CPR/AED

These skills go hand-in-hand. First aid can always come in handy to know at any time of the day or any day of the week. These go without much explanation.

AED – Automatic External Defibrillator – is a skill you get when you learn CPR (Cardiopulmonary resuscitation). I get trained every two years in CPR. Never know when it might come in handy and I've used it once on a random victim many years ago. Don't think I helped save his life exactly, but he was still alive when I left the scene when other, more highly trained people took over. I would love to see everyone trained... you know in case *I* need CPR!

Obviously most people do not carry with them an AED, or the CPR masks. In this day and age most people are taught to use a CPR mask to prevent contact with the victim's bodily fluids. In general if you're rescuing a family member you're probably not going to think twice. But a stranger might be carrying any sort of disease from AIDS to hepatitis to Zombie Brain Burn (whatever that is). So you might reconsider the circumstances. In the end, it's up to you what you do.

Basic first aid includes stopping bleeding and keeping victims from going into shock. Shock can kill the victim as surely as can a bullet wound.

Navigation (Land, water, and other terrain)

Navigation, how to get from one place to another, or to get yourself OUT of the woods and back to civilization is a skill we all possess to some extent. We know how to get to the store, the movies, the gas station, to work from home and back again.

Basic outdoors skills to find your way into the woods (to that deer stand or the creek where you fish) are generally lacking in most people. Few people spend time growing up around the woods and learning from experience. Urban residents who see a park occasionally rarely have any experience in navigation in the woods, though, they can tell you how to get almost anywhere in a city. The two types of people (of course we're generalizing here) have similar skills, but operate in different environments.

Navigation skills include learning to use a map and compass (together!), use a map to identify distant features, fixing (locating) your position on the map using the compass and deciding which direction to go if you don't have a map, compass or other helpful items.

Simply knowing that if you follow a stream or river downstream will generally (not always) take you to civilization. That's a form of navigation. Knowing that in certain areas (for example the African Savanna) a certain kind of bird (White-Browed sparrow weaver) builds its nest only on the west side of the tree (to get out of the prevailing east winds) gives you directions. (Of course knowing what a White-Browed Sparrow-Weaver looks like would help...).

Looking at the north star will give you true north, and knowing you can use a vertical stick to get directions from the shadow of the sun easily are also a part of "land navigation" skills which are easy to learn, teach or use.

Navigation, like all other survival skills provides you with a method to stay alive in unfamiliar terrain, and to get you back to civilization – assuming that's where you want to go.

Survival skills of all sorts are those things that help you survive long enough to get somewhere safe. That's the whole purpose. If you're using "survival skills" on a daily basis you're no longer surviving, you're "living".

Those "living skills" become ingrained, you pass them on and others learn from you.

Hiding, escape and evasion

Hiding from an enemy, dangerous animals, gangs or Heaven Forbid “The Government” is a survival skill too, especially if you’re trying to stay alive anyway. Escaping and evading in general becomes a skill required in only one real situation. Either someone is out to get you or you’re in “enemy territory”.

In either case this becomes a skill used along with navigation, fishing, hiding, hunting, making a fire (and knowing when not to make a fire, knowing when not to signal, or use a radio transmitter), finding water and many, many other skills some of which I haven’t even listed here to keep you alive, get you away from the danger and avoid detection by the “enemy”.

I’ll leave the “enemy” to your imagination but in this day and age of technology unless you’re up against a pretty rudimentary enemy you probably aren’t going to outrun the cops, governments, military personnel, drones and bullets out to get you. We used to have a saying, “You can’t outrun Smith and Wesson, or Motorola”; we were referring to our weapons and radios of course.

You might be able to prolong your life if you’re skilled in these things.

If you’re going to learn a subject, certainly read, but try taking a course. You might be surprised at the amount of knowledge you can gain with carefully pointed questions when they are aimed at a good, experienced teacher. The most important thing about things like navigation skills is getting out there and doing them. Simple, rudimentary skills at locating yourself on the planet are very important and easy to do.

There are a few books available out there, and both “Urban” and “Rural” (or woods) type of Escape and Evasion skills are considered in the books.

Miscellaneous

Psychology (yes, understanding what the OTHERS will do!)

Planning for the worst – hope for the best

Expect the unexpected

Personal motivation, survival mentality – why should I keep going?

These last four skills are less “skills” and more “mental preparation”.

Most of you won't have a degree in psychology, or even to a great degree care much about the subject. Rest assured if you think like a bad guy, you can guard against the bad guys. If you think like a terrorist you can predict their behavior. If you think like a cop and train like a cop you can understand how they think as well. If you can put yourself into the position of a would-be “enemy”, or a friend, or a co-survivor you will be able to predict behavior of those around you.

Why is this important in survival? If you're alone, why worry? Good question. If you're alone you only have yourself with which to be concerned, but if there is even one other survivor with you one of you will have to take the lead – or in other words, become the leader. If you're skilled, that will automatically be you. Survivors can panic, be scared easily, worried about being “late for dinner” or have any of a dozen other emotional conditions which might require you to calm them and direct them.

You might have people who are with you who are downright dangerous because they don't KNOW what to do, and won't listen. You have to get control of the situation.

You could be with some less than savory people who might stick you in the back with a knife on the first opportunity.

Being a good judge of people when face-to-face is also a survival skill and helps you use your own knowledge of psychology to help control the situation.

Of course no one needs to go out and get a degree in psychology. Where psychology SHINES is being able to – well, to be blunt – profile people. Yep, you heard me, profiling good guys, bad guys, terrorists, gangs, banditos, boat boys, Islanders and survivors. Being able to get a grasp on the type of people you must deal with when trying to survive will keep you alive.

Knowing that the bandito on the border is going to shoot you if he gets the chance will make you grasp the one important thing you should know about survival above all else... DON'T BE THERE WHEN HE SHOOTS!

Knowing people and the way they act and knowing to not put yourself in a dangerous position in the first place is a basic skill (one I didn't list, exactly as you shall see in a moment).

Psychology is a good thing to know. Basic psychology and “mob psychology” will give you some incentive to not become involved in a mob, avoid them at all costs and if you're an unlikely, unlucky survivor of a plane crash with no obvious leaders other than a chaotic, psychotic loon you might be better off going it alone. If you've chosen to be the leader, then knowing how to get people to do the right thing to stay alive becomes one of your most important goals. Keeping others alive will keep you

alive, most of the time. Helping them help themselves is the best thing you can give them.

Getting away from a bad situation that is getting worse though might be your only right choice and understanding behavior in others is one skill you should develop.

Is this easy? No. I'm well on the downhill slide heading into my 6th decade on the planet and have had a lot of years just observing people from a distance and noting their behavior – and I've developed a kind of sixth sense about folks. I can usually tell in a matter of seconds after meeting someone if they are going to be trustworthy or slugs. I'm not always 100% right either, but right enough that I trust my gut. I personally suspect this kind of skill comes only from experience with others.

I wouldn't expect everyone out there to develop this skill except after a long period of time with a mind to doing so. But you can certainly read up on how groups behave – say, survival groups, books about survivors, stories about survivors, stories about surviving plane crashes, boat accidents, mountain climbing accidents and so forth. There are plenty of books. Go to the local library; don't necessarily buy them, just read all you can get your hands on.

What this will do for you is give you a wide range of “mental experiences” even though you didn't go through them yourself. One of the underlying skills you will gain from reading about others is having “already thought out the subject in detail” and your brain will put the things together at the time you're in a similar situation!

That is what I consider the “psychology” of “survival”. Knowing what others who've gone before have done, understanding something about human behavior, learning from your own experiences and doing, practicing and making mistakes.

This is where “planning for the worst – hoping for the best” comes into play. Since I was a child I've used that phrase. For over fifty years I've lived by it. Sometimes I think it is what gave me high blood pressure, “What-Ifing” everything. And sure, I've had people say “You can ‘what if’ something to death... blah, blah, blah” but every single time I've thought out a situation and went through everything I knew about the situation mentally I came out ok. I didn't die (and I've been in several life threatening situations in my life now, not by choice).

I can only recommend that you plan things out ahead of time, even if you never expect to be in that particular, harrowing situation. Think about it before hand. Guess at what the conditions would be. It's a mental exercise that keeps you sharp and thinking, not a waste of your time as so many people have told me.

We know you've all heard or maybe said it yourself, “IF a nuclear bomb is coming, I'm going to grab a six pack and lawn chair and see what happens”. The truth is I've never said that. I've always thought about how I can escape. Even if I don't, at least I tried!

No matter what, never give up hope that you will get out of the situation you're in. You might not, but you might be surprised when you do that it “didn't seem quite as tough as it really was”!

You might think, “Wow, that was lucky” but you will now see it wasn't luck. It was you, your ability to keep calm, think, adapt to the situation and overcome the circumstances. It was your thought processes beforehand that helped you.

This brings us to “Expect the unexpected”. What’s that even mean? How can you expect something you don’t expect anyway? Well, you can’t. But all of us have an imagination – and in some of us it is much more active than we will admit in public.... but that’s another story. The fact is, if you’re walking down the street and a bank robbery happens right in front of you and you’re standing there like an idiot while the bad guys are shooting at witnesses you’re going to die. My “exercise” is to always be alert, what’s going on around me and then consider the “What ifs” that might happen even though I can’t even believe it might. Even at my work place, considered a very safe location I’m constantly considering the What If; what if a terrorist attack occurs? What if there’s an active shooter situation? What if there is a fire, burst pipes, power outage? Randomly I’ll find myself in an area of the buildings that might be nearly unpopulated and I consider “What if there are zombies?”

No, not really. But you never know, right?

Walking past the bank, I consider what IF there is a bank robbery and I’m caught right here. What do I do, drop? Run? Pull my own weapon? What if they are armored? Pulling my own gun won’t help. Running might. Diving for cover might. Dropping to the ground will get me killed, so running, zigzagging away is my best bet! Which way?

Run through traffic? Well, any which way that’s going to put something between me and randomly applied bullets! And those people in those cars I’m running between, what about them? Sorry, they are on their own. This is about saving ME at the moment! Don’t get me wrong, there are times when I might go to the aid of others and most likely for me, that will be priority number one. I was trained to run towards the gun fire....

The building in front of you a block away suddenly explodes. What do you do? What do *I* do? I dive for cover or to the ground facing away from the explosion, before the blast wave hits me if can. Glass will be flying. Piece of things, people, rocks, gravel – you name it.

Get out of the line of fire. In fact, as soon as you can you would move away from the building as quickly as possible, since there might be three more bombs. Maybe five more, maybe someone was launching mortar shells in that direction! Maybe it was a plane hitting the building and another building close by is the next target. Not going to happen, right? Well, it did in New York (more than one plane). It happened in Boston (more than one bomb).

So, expecting the unexpected is as simple as playing a mind game with yourself. Think of the most unexpected, outrageous thing you can imagine and then imagine it happening right in front of you. Then roll the scenario through your mind forward, then backward.

Consider various conditions, weather, wind, rain, snow, high traffic, low traffic, wild animals escaping from zoo in the middle of everything and an alien UFO landing at the same time. Highly unlikely by any odds but still it’s a mental game, just an exercise. It is not kooky or crazy to brain-game things. It’s called “Our Imagination”. Use it. That’s why we have it.

Every exercise you do helps some muscle. Let’s help those brain muscles! We don’t really have muscles there, but we do have neurons which, when you’re

learning reconnect different lines together to help you learn and remember. This is what it's all about.

Personal motivation, survival mentality – why keep going? Why indeed. All of us have an innate, instinctive need to survive. Don't believe me? Hold your breath until you pass out. Go ahead. Lie down on the bed and just hold your breath (that way if you pass out you won't hit your head). Are you holding your breath? Fine...are you passing out yet? No? No? Normal people can't make themselves pass out by holding their breath, under normal circumstances. Your body will not let you do it. Even if you DO somehow succeed in passing out from holding your breath, your brain will make you start breathing again. (It's the autonomic physiologic responses that are built in.)

I have tried this experiment before in classrooms where I was teaching. No one has ever fainted. I've tried this with my kids (you know, when the children hold their breath to make you do something – that doesn't work with me) – I just wished the kids luck with that. The fact is you will do everything you can to survive if someone puts a pillow on your face. You will try to get to the surface of the water you suddenly find yourself in in a bad accident.

You will pull your hand away from the flame. You will close your eyes when the wind blows dirt at you (and hopefully beat that one sand grain!) and you will run, duck, dodge and seek concealment or cover if someone shoots at you.

Those are your personal, built in survival instincts; those are your personal built in skills, the ones you didn't have to learn, the fight or flight response.

Your heart beats, you breathe, respiration occurs autonomically, you excrete, and you will eat food and drink water based on what your body tells you. Eventually you will have to go to the bathroom, you will have to eat, and you will have to have fluids. Those survival instincts keep most creatures alive without even thinking about it.

Animals have a fight or flight instinct as well. If they can, they will flee danger. If they cannot, they almost always will turn on you and fight, no matter how big or small. Even mice will fight you no matter how big you are if they are placed in a position to fight and are denied a flight path!

So, why survive? Why not just give up? Unless you are so beaten and lose the will to live your body will try to keep you alive.

If you are at the point where you've given up, somewhere along the way you did something wrong. You skipped one of the other skills. You perhaps didn't look for food. Or perhaps you couldn't. You don't have water or couldn't get to it. But if you have tried, and I mean **tried** everything and finally give up out of weakness (not mental, but physical) then you at least tried.

If however, you still have any opportunity left to you to live, keep going, get even, kill whomever put you in that position, see your family, rescue someone else, or just to write a book when it's all over then you have enough to keep that "will to live" in you.

And don't laugh at writing a book either. Some survivor books have made a lot of money for the survivors. What the hell, why not, right?

When all is said and done, these few skills I've personally picked as "basic skills" are probably more than most care to know. Honestly if I had to pick five skills right off the top of my head everyone should know they would be simply make fire, make shelter, find water and food, signaling for help, basic first aid are my main, most important skills to know. There are others of course, such as navigation, staying warm (or cool) and figuring out how to get help.

If it all goes to hell tomorrow and you're kicked back to the Stone Age you can survive, you can travel to another place that has more food or water. You can regulate your body temperature in winter or summer. You can find food. You can find water. You can stay warm, cook your food, purify your water and keep the evil night creatures away with fire. So... why not learn those now?

====

I hope that those of you who took the time to actually read this learned something or at least confirmed for yourself you're doing the same thing others are when it comes to learning about survival. I don't expect many people to read this whole article, and I don't expect everyone will see it like I see it but I hope somewhere along the way someone, somewhere will find this information helpful and if they find themselves in a very bad, bad situation it will help them survive to live another day and perhaps even write about their own adventures.

Remember: **Plan for the worst, hope for the best!**

Combat Mindset: The Cooper Color Code

Self Defense is for me and my family a daily matter. Self-defense isn't necessarily a weapon, or a martial art, but like Survival, it's a state of mind. You have a brain, use it. Think things out before they happen. Consider constantly where you are, where you're going, look around you, be aware. We call it "Situational Awareness". It is said that the best way to win a fight is to avoid one. Don't be there when it happens. Don't travel in areas that are dangerous and if you must do so, do so without letting down your guard and go armed if you can. If you're knowingly going into a combat situation, with a combat mindset, it's one thing. Finding yourself in a combat situation while having been minding your own business and getting yourself into a combat mindset is wholly another.

Unfortunately, when growing up I was the kid with the glasses, the "book worm", and the guy that the bullies singled out. That went on through part of elementary school and into Junior High. Dad was a Black Belt in karate and a former Marine. He taught me various fighting techniques over the years including some karate, shooting, and how to defend an unarmed me against a knife attack. I grew up in Detroit for part of my life, so those lessons came in handy more than once.

But it wasn't until my 9th grade of school that certain thinking patterns actually came into being for me. Moving from one class room to another one afternoon through the crowded halls a group of kids had gathered around two would-be combatants. One was a pitifully small boy with glasses (like me) who was pressed against a locker by a much larger boy, his forearm against the smaller kid's throat, choking him. The one-way conversation was something about "...bring twice as much lunch money, tomorrow, punk..."

I realized I could walk away, go on to class and ignore what I saw like the other kids were doing. But I also knew the bully wasn't going to stop with that kid and I was likely on his "list". I made a snap decision right then and there to either put a stop to it, or die trying. I have no idea why. I was scared of fighting, hated being hit and worse; I didn't like getting blood let out of my body for no real reason. To this day I'm honestly not sure why I did what I did next. I stepped out of the crowd and tapped Mr. Bully (a full head taller than me, stronger and from rumors, a "karate expert") on the shoulder. It had the effect I wanted. He let the little kid go and turned on me. The little kid fled down the hall.

He reached for me saying "WHAT!?"

I stepped back and smiled. When he took a swing at me I calmly blocked it and shoved him backward. I was scared to death, but the block was automatic from whatever meager training Dad had given me.

I was now committed. He shouted "What do you want FOUR EYES!?"

I smiled and said simply, "You. Me. 3 o'clock. Outside the school on the playground."

He didn't say a word. In fact, I expected him to punch me in the face, but he didn't. He dropped his hands to his side and looked at me in a kind of weird way, like he'd never expected anything like that.

I turned around and walked away. Then suddenly I was shaking, scared and about to piss my pants. But the little kid was safe for the time being. The crowd in the hallway had gotten quiet and the bodies parted like the Red Sea for Moses. I had about an hour to contemplate my fate.

At the appointed time I walked to my locker, collected my books and walked outside to a huge crowd. Kids all over the place parted as I walked over to the playground. My mother was standing there at the car waiting for me and when I walked to the playground she started yelling at me. I ignored her. Mr. Bully was going through some kind of “warm up” I guess. Practicing katas or something, I don’t know.

Dad never taught me all that stuff. He showed me a few things and moved on. I suppose what this clown was doing was trying to impress his little gang of boys hanging around him, or scare me. It didn’t work. I walked right toward him. He went into some kind of a stance then charged me trying to do a round house kick to my head. He missed.

I didn’t. I swung my back pack full of books as hard as I could and connected with the back of his head as he went past me. He dropped like a sack of potatoes and lay there face down, hands at his sides, unconscious.

I walked off the field and my mother started screaming at me. That was embarrassing. I laughed. I’d won that day.

The next day I was called into the office by the Principle. He made me sit down and wait awhile, probably to stew. Finally he closed the door and sat on the edge of his desk in front of me and said, “You’re going to be suspended for three days for fighting, since you started it. Your opponent is in the hospital. You gave him a concussion. If you repeat what I am about to say I’ll deny it. Thanks for taking care of that asshole, but don’t gloat and don’t pretend it wasn’t an accident that you got a lucky shot on him. He is a pain in my ass, and a bully. I doubt he will be back to school this year. Get out, stay out of trouble and I’ll see that you get your homework for the next few days.”

That was that. I never once again found myself in such a situation because I became quite aware of my surroundings from that day forward. I’ve almost never let down my guard since then, almost half a century ago.

I didn’t tell the story to brag or be funny or especially not to convince you to “be the hero”. In fact, I don’t recommend ever jumping into a fight you can walk away from. I could have walked away and should have done so—but that guy would have come looking for me eventually.

No, don’t just jump in, but, the rules for me are 1) Don’t be where there is a problem, 2) don’t go where there looks like there’s going to be a problem, 3) Don’t start fights and 4) If someone else tries to start one walk away if you can. 5) If you can’t walk away, get in the first punch, shot, baseball bat, use anything to hand, cheat, fight dirty, use the loudest battle cry you can and don’t back down. Sometimes there comes a point where walking away and letting others handle the situation isn’t the right thing to do and I think to this day I did the right thing.

At the time I had only my own “street smarts” which admittedly weren’t all that fantastic and dealing with other kids and bullies day to day. But I was a young kid. Even though I’d been in spats before with other kids, that incident was different. I saw

the bully for what he was. His reputation preceded him and I knew about his bullying kids in the past, his so-called “black belt in karate” and his winning “every fight”. I had begun my own thinking and planning instead of letting events take me where they would.

John Dean “Jeff” Cooper was a United States Marine and the creator of what is known as “the Modern Technique” of handgun shooting, and one of the 20th century’s foremost international experts on the use and history of small arms. Professor Cooper created a “color code” which he subsequently taught to Marines, police and civilians. His – and my – idea of survival always involves the use of your brain. We’ll talk a bit more about him in a moment.

As I have stated over and over, your brain is the number one tool in your repertoire of items you can bring to hand. A knife is good. A gun is better. A stick is better than nothing at all, and your hands, arms, legs and muscles are to be relied on when nothing else can be. However, without your brain, without thinking and without being cognizant of your surroundings you are little more than an animal fighting for survival in a dangerous situation.

I believe most people reading this will have a grasp on what happens when your adrenalin begins to pump. But let’s summarize:

Adrenaline is a hormone. It is produced by the two adrenal glands located on the kidneys. These glands secrete adrenaline directly into the blood stream when people are exposed to something that may be dangerous.

Adrenaline takes a couple of seconds to have an effect on your body. This delay is important to your reaction because it gives you a pause to consider your options, because once adrenaline kicks in a lot of things happen at once, and your focus narrows. What you’re going to do as a cognizant, thinking person could change drastically to a reptile-thinking-fight-or-flight response.

Adrenaline increases your heart rate, raises your blood pressure, and is associated with a diversion of blood away from some areas of your brain and internal organs and into your muscles. As a result, adrenaline has the ability to increase speed and strength. Adrenaline also decreases how much pain you might experience. A large amount of adrenaline released into your system all at once causes what is sometimes known as an adrenaline dump, rush, or surge.

All of these effects are designed to prepare your body to either run away or to fight. Your thinking most likely will become impaired by an adrenaline dump. Some people experience feelings akin to terror. Others experience a kind of euphoria.

Adrenaline can make you feel energized, or it can make you feel shaky, weak or sick to your stomach.

Sometimes all of these feelings come at the same time, which can be confusing. Results of an adrenaline surge might also include feeling as though time has slowed down, tunnel vision, where you only see what is in front of you and not what is around you, a sensation of your mind wandering or floating, making it hard to concentrate. You can experience decreased coordination and difficulty in thinking clearly.

This isn’t a treatise on how to handle an adrenaline dump; there are plenty of other texts on the subject. In fact, I’m far from an expert on the subject, this is merely

provided for your consideration.

Professor Cooper introduced his “color code” not to give you an indication of how much danger was around you or apparent, but rather to help you to think through a difficult situation – your state of mind.

In fact, his teaching explains that this color code relates to the degree of peril you are willing to do something about. This allows you to move from one level of mindset to another to enable you to properly handle a given situation. Now, whether it becomes a fight or flight situation is more easily handled by a reasonably thinking person than it would be by some who isn’t thinking; i.e. experiencing a massive adrenaline dump and not concentrating on the subject at hand.

Does it work? To some degree it works for me. But since the time I learned about this color code and thought it through over the past few years, I’ve not found myself in a situation that would require fight or flight. I have used it when emergencies crop up. My wife and I have helped in car accidents, we’ve been storm chasers, and been in a couple of bad situations on a sailboat. Either way, I have noted that I personally tend to be much more aware of my surroundings, what I am doing, who is present and I pay a lot more attention to strangers nearby than I used to. I’ve also noted situations where it was apparent to me (but no one else with me) that two people were passing covert messages about passersby. Were they would-be thieves or robbers? It is highly likely they were and because of my awareness I was able to skirt the problem by going in another direction and leaving the area.

I know my wife uses this technique and is aware of people around her. She and her Girl Scouts successfully avoided pick pockets on a train in Paris once because they were aware of the eye contact the others were making, signaling one another about the “unaware girls”. When one of the strangers made his move on one of the young girls, my wife and the other leaders ended up alerting the entire train car by making noise and pointing out the two or three offenders who rapidly vacated the train when it stopped.

The color code has nothing to do with tactical situations or alertness levels, but with one’s state of mind.

The USMC also uses “condition Black”, although it was not originally part of Cooper’s Color Code. I would equate Condition Black with a state of mind that disallows all thinking processes and the individual has gone into a kind of “berserker rage” and might be in some cases why anger leads to murders... but neither am I a psychologist or lawyer, so it’s a guess for me.

In short, the Color Code helps you “think” in the seconds leading to a fight. As the level of danger increases, your willingness to take certain actions increases. If you ever do go to Condition Red, the decision to use lethal force has already been made (your “mental trigger” has been tripped).

Colonel Cooper's States of Readiness

Condition White: You are essentially unaware of anything going on around you. Maybe you're fatigued, distracted by some worry, or had a bit too much wine with dinner. Regardless of the excuse, you are not ready — for anything.

Condition Yellow: You are alert but calm and relaxed, scanning your surroundings for potential threats. You know who's in front of you, to your sides, and behind you. You don't think anyone will make a hostile move, but you are mentally ready in case something untoward develops. Yellow should be the "default" condition for every martial artist. It should be your default condition, martial arts aside.

Condition Orange: You recognize that something is out of the ordinary, and that the chances for violence are increasing. At this stage you note the positions of all potentially hostile individuals around you, as well as any weapons they may be able to use, in their hands or within their reach. You develop a plan for dealing with the potential hostiles, including identification of escape routes. In addition to being mentally ready, you are physically ready as well.

Condition Red: You are engaged in combat. Someone is assaulting you and you are reacting to the attack and defending yourself. You are taking immediate and decisive action to stop your opponent, or evade and get help.

Condition Black: You have had a catastrophic breakdown of mental and physical performance. Usually over 175 heartbeats per minute, increased heart rate becomes counterproductive. You may have stopped thinking correctly and clearly. This can happen when going from Condition White or Yellow immediately to Condition Red as well.

Field Expedient Weapons

As usual, this is not an all-inclusive dissertation on the subject, just a short introduction to invite you do more research on your own. This entire paper is written to give ideas of things to consider, things to research and where to begin your research.

There are dozens of items you can pick up in an emergency and make a weapon from the object. Rocks, sticks, pipes, beer bottles, beer glasses, plates in the restaurant that fly like Frisbees, chairs, tables and any other objects you can bring to hand. Making something on the run is not a skill most people have or consider until they are being chased or are nearly caught in most cases. In an urban environment you might be hard pressed to locate sticks, stones, rope, chain and so forth.

You might or might not be able to “throw together” something in a bad situation, on the run. It pays to think things out ahead of time – always – and keep situational awareness in your mind at all times. You might notice there are items on the ground. You might not. Again, this is not a dissertation on every idea or an expert paper on what you can and can’t do. Rather we will give you a few ideas to consider and show you some links and images of items others have already thought of making.

Why re-invent the wheel? Check these links.

[Survival School: Guide to Making Survival Weapons for Wilderness](#)

[Several Links on One Page](#)

Locating Water

In a survival situation, usually shelter, then water and finally food – in that order of importance is your priority.

But, of course it all depends on the circumstances you find yourself. Either way, you can't live very long without water. You need fluids to keep going, to replace what you lose sweating and through normal biological functions. Given a normal, healthy adult you can live three days with no fluid intake... give or take a day or so. If you have never heard of the "Rule of Threes" then think of it like this. You can live three minutes without air, three days without water and three weeks without food.

In a cold, damp, snowy environment you will be inundated with cold. You probably have about three hours to live without shelter.

Of course, remember that this is a rule of thumb, not an absolute. If you fall into a frozen lake, you have about 3 minutes if you're not in great shape.

There are things you must do, in any given survival situation to remain alive. We've pointed them out before here. In most cases those things are in this order; 1) Shelter, 2) Water, 3) Food – this gets you out of the rain or snow and cold, gets you something to drink and eventually you will need food. In cold, getting a fire going becomes a priority even before water, and various conditions will dictate the order.

Here we will place links to various sites and articles about locating, cleaning and purifying drinking water. As always, read and throw out anything that sounds "wrong". Use your common sense. If you ever find yourself in a situation where you need to find water, you will at least have a working knowledge of how to locate water. Also, as always comments are welcome and place any links you believe are good in the comments and they will be added to the text of this page.

<http://www.survival.org.au/water.php>

http://www.millennium-ark.net/News_Files/Water/Finding_Survival_Water1.html

<http://www.wilderness-survival-skills.com/findingwater.html>

<http://blog.mysanantonio.com/samcoffman/2012/04/urban-survival-and-bugging-in/>

Water Storage at Home

(Notes for 2013: You will note original links that were listed are broken now and have been removed from this paper. Some of this article is possibly outdated now but I have preserved for reference. Notes and updates will be found throughout this article and have been added to this paper rather than the original article. This article was written approximately twenty years ago (Around 1993-94) for a "Survival Email List", which is how we all communicated before the "World Wide Web" came into existence.

The article has been somewhat updated a couple of times for today's world, but the more things change, the more they remain the same. The "children" mentioned are now all grown adults and most of them have had their own children now. We are grandparents thirteen times over now. The "Children" however took many skills away when they moved out and we note they store food in copious quantities, most have some kind of water storage set up, almost all of them own and know how to handle weapons, but one thing that never changed was the fact that the little ones – now grandchildren, just love macaroni and cheese!

Finally, please remember this was written prior to the year 2000 and we now look back at Y2K as kind of a "human stupid moment" these days. But, my friends this is what I mean when I say "Prepare for the worst, hope for the best"!)

Water storage at home is rarely considered by "normal folks", that is, those who do not think of keeping extra food supplies around "just in case". But with five children, most of whom always seemed to be teen-age garbage disposals tend to necessitate keeping large quantities of food around. Now, we only have three living at home, but we have one coming to stay with us again for a few months, another one married with two babies. So once again, the extended family shows that keeping extra food around is probably a good thing. Unexpected visits generally result in a rapid depletion of normally kept items, especially through the use of quickly "thrown together meals". For some reason, youngsters love stuff like macaroni and cheese. I don't know why, since I personally hated the stuff when I was a kid (but love it as an adult).

How does this equate to storing water at home though? In light of recent storms that have dropped killer tornadoes on peoples' homes across the country, I would think that anyone with enough sense to make daily decisions would consider that "it can happen here". This means anywhere. Tornadoes occur all over the planet. They do not confine themselves to tornado alley, or Oklahoma. Although the most tornadoes or funnel clouds I've ever seen happened to have been in Oklahoma, Colorado gets its fair share as well. We also get bad winters occasionally, where you are maybe snowed in for a few days. In the case of Colorado Springs, generally we do not lose power on a regular basis, but other parts of the State and country do. With summer coming on, we have to worry more about lightning and the loss of power from a lightning strike. It has gone out for hours at a time after a terrific storm or two. Water can stop pumping at times like that. Especially if a pumping area is affected. It is a good thing to keep a bit of stored water around, in case of normal weather phenomenon affecting your area of the world.

So, storms, both summer and winter, can cause situations where water may be temporarily reduced in quantity or access. It is therefore important to plan for such contingencies, and store small amounts of drinking or cooking water. I've placed fifty gallon plastic water barrels in my home for just such a situation. Because of the location of storage, in the basement, the water is kept cool and in the dark. Once every six months, as dictated by the Red Cross and FEMA, we rotate the stock. Generally, I simply empty the tanks, and refill with fresh water. A simple garden hose

water siphon is used to obtain water if necessary from the tanks. Have we ever used them? Not yet.

In addition to these tanks, like most homes, we have a water heater. Water heaters contain from 25-60 gallons of water, depending on the size of your home and hot water consumption. If the power goes out, or if there is a sudden natural disaster, the first thing you should do is stop bringing water into your home. Floods, or earthquakes, or other destructive forces can cause water contamination. Perhaps by breaking open chemical or other storage tanks nearby, or by dumping large quantities of contaminants into the water source (perhaps an open reservoir). In this case, stopping incoming water at your water shut off valve prevents you from contaminating your water tank. You now have up to 60 gallons of water that you can use in an emergency.

Every time my wife goes shopping at the grocery store (we use the military base commissaries most of the time) she generally buys a gallon or two of bottled drinking water. We keep 10-12 gallons on the shelves for short term emergencies. Water stores for a very long time if sealed properly. In the case of purchased water, the gallon jugs are sterile and sealed and will likely keep good water for several years. I would suggest using it up every year at least, perhaps about six months – just to be on the safe side.

What about emergencies? No large containers and you know the water will stop flowing shortly. Easy. Clean plastic garbage bags and pillow cases! Take 3-4 plastic bags, one inside the other, and a large pillow case. Place the bags inside the pillow case, and fill it with water. The cloth supports the plastic bags, which are 3-4 thick now (to prevent pin-holes in one bag from leaking out). You can then fold the bags over and over to close off the open top of the bag, tying it shut with string and you can now carry these bags off to a vehicle, or store them someplace until needed. Placing two of them together, tied with rope or string, you can make a handy carrying bag set over your shoulders (one hanging in front, one hanging over your back). In a hurry, this make-shift storage container will allow you to move or carry several gallons of water, rather quickly. If nothing else, it will allow you to QUICKLY store water until you can move it to better containers.

Another emergency location for water is in the water tank on your toilets. The water in the tank is clean, and comes from the water pipes coming into the house. If you have multiple toilets in your house, you might have as much as 5-6 gallons of extra water, already stored. Of course, this means not flushing the toilet! But, in such an emergency situation, it might be best to keep the water and worry about the flush later! Remember, this is an **Emergency** (and you forgot to store water by some other method – I have to assume anyone reading this article is 1) Planning ahead, 2) already storing water and trying to ‘confirm they are doing it right’ or 3) is just curious how the rest of us “survivalists” live).

A few weeks ago, my wife asked me if we could get a hot tub. I thought about it, and thought about how expensive it is, how much of a pain to maintain a hot tub would be, and the fact that my wife has wanted one since the day we were married years ago. Then I thought about how we could incorporate a hot tub into a water storage scheme. After all, they hold on the order of 300-500 gallons of water. Given the fact that I basically plan for short-term “disasters”, like blizzards, we generally

keep about 100 gallons of water on hand. I've expanded that a bit for Y2K contingencies, but only to about 150 gallons. So, here is what we decided.

The purchase of a hot tub would mean that we get to enjoy it year-round, especially since I always seem to have lower back problems. The water in a hot tub is not fit for human consumption when used for human bodies. It would be OK to use it to wash with, or perhaps even use to clean clothes or to use for toilet flushing, instead of using fresh water for that. However, it is possible to use a cleaned and sterilized hot tub for temporary fresh water storage. Y2K is a possible time when something like this might come in useful. Considering the possibility that water, electricity and other utilities like natural gas might suddenly become unavailable, a water storage scheme including a hot tub would be a handy idea. So, towards the end of December, 1999, I have plans to drain and sterilize the hot tub, refill it with fresh water and keep it ready for a couple of weeks – **just in case.**

(Note: I did actually drain that tub, and simply added chlorine just before Y2K. Some days later we had a blizzard and wound up using the water in that tub for toilet flushing and washing when pipes froze and we had to await the plumber to make repairs while we cleaned a flooded basement.)

That just added about 450 gallons of water to my storage, for a total of about 620 gallons of water. That's 100 in barrels, 50 in the water heater, and other 12-20 in the gallon jugs in the pantry and 450 in the hot tub. If you figure the water usage per person in a home at 1 gallon of water, per person, per day that gives me enough water for one person, for over a year and a half. Since I have five people at home that gives me: $620/5=124$ days' worth of water. That is enough to keep my family in food, water and spit-baths for four months. OK, we can now take care of ourselves if Y2K turns out to be a "bump in the road" like everyone seems to be saying.

(Note: Y2K turned out to have a few glitches here and there around the world, but nothing significant.)

If not, at least we now have placed ourselves in a position to be able to work at other methods of obtaining water. That brings me to another point; Rain water. While I probably would have a hard time bringing myself to drink water falling fresh from the sky due to air pollution and so forth, I would not have any trouble doing so, if I made sure the water was boiled or distilled afterward. Most likely though, the only contaminates in rain water would be microorganisms picked up from the air, or from bird waste. Water falling on a roof and running to the gutters collects dust and debris, which is then fed down the water spout. The water coming down the spout is not likely clean enough to drink without boiling. However, after it settles for a bit, you can boil it and most likely it will not contain dangerous levels of chemicals that would kill you. Sometimes, and in bad situations though, you have to weigh the choices. Water with some chemicals picked up from the air might harm you over a great deal of time, while not drinking anything would kill you in a short period. So, make your choice now, and determine your own level of comfort before you are forced to decide in a hurry!

Storing rain water isn't as difficult as it might seem. Except when you start storing it. Now, I have not yet tested this, nor have I actually built any devices to store rain water, BUT, this summer is almost upon me, and one of my plans happens to be to build a water storage cistern. Essentially, we will dig a holding area, and place covered water containers underground. This will allow each to spill into the next as they fill. Thus, you have several water containers that you may use containing several gallons of water each. At the very least, you have water to water a small garden this way. In an absolute emergency, without any other water source, you can gather a few-

days' worth of water for one or two people, during rainy seasons. Check with local hardware stores on items that can be used to store water in an underground environment for a few days at a time. I would think that anything from clay storage tanks to plastic tanks of some sort would be OK to use. Remember that you must have a way to remove the water. Personally, I believe it best to build such a device with lids that can be removed easily and the water dipped out with a bucket or pitcher from below. Be careful of dirt contamination though, and never drink rain water without first sterilizing it. This can be done by boiling the water for several minutes, or using chemical sterilization techniques such as chlorine (common household bleach will work fine, if you use the right types).

From here, I suggest you go to the following links and read more about water purification and storage. I also, **STRONGLY** recommend you look into ways to store the quantities of water your family will require for a minimum of three months.

(Note: the links that appeared in the original article have been removed because they are mostly dead now.)

I've written this (and other articles) because I personally believe that there are some changes a-comin' and we'll all be affected to some degree. If you have your own water, you won't want to come and get mine and I won't have to defend it. Therefore, if we all plan and prepare for natural and man-made disasters ahead of time, we count less on our neighbors, the government and others around us.

We can, and will eventually force this "big government" idea out of people's heads by becoming more self-sufficient. Today, so many of our friends, relatives and neighbors simply COUNT on government assistance when something goes wrong, they do not consider things like insurance, and self-sufficiency. To me, this is a sad, sad state of affairs and is the beginning of the end of our way of life. It is too bad that so many will not prepare and will be cause unawares, and then expect those of us who take the time to help ourselves, to support them.

I for one will NOT get "caught unawares", and think if you like I'm a "Y2K kook" or "conspiracy theorist" or any other negative-sounding title you can come up with. But do not come crying to me if your baby doesn't have milk, or your kids are hungry, or you can't keep them from getting cold when the power goes out. I will have little sympathy when that day comes and you didn't take the time to care beforehand. So... read up on it now, prepare and be ready for whatever comes your way!

September 2013 Notes:

Today we live in a world where if the electricity goes off for more than a few days, panic will ensue, stores will be emptied, gasoline will rapidly run out and even if it doesn't consumers will be gouged on prices (it's not even illegal in the state of Colorado to gouge consumers, by the way).

Of course Y2K came and went; the troubles were mitigated by system administrators in most companies and computers were upgraded, bios' were upgraded and there have been several iterations of computers and even the Internet since then. We likely won't run into anything remotely close to Y2K any time in the foreseeable future.

However in recent weeks as I write this we've watched as a classic Cold War Escalation Scenario has brewed between Russia and the United States over Syria. The day could still come when such an escalation boils over into a nuclear war, limited or not, it will put millions of us in a bad way without electricity, gasoline, moving food, water supplies and being able to even communicate with one another.

As you can see, even given the distant history of the above article, it is still somewhat relevant today.

In my case, my home is for sale, but we still have it along with the hot tub, storage tanks and so forth. You should too. We are selling and moving to someplace "safer", where I won't be bothered by "big government", I can practice my fishing (I'm a poor fisherman) and live my life to my heart's content, come and go as I please,

when I feel like it, not when I'm told by some government entity. In the meantime, I still have my beans, bullets and bandages—along with other survival supplies, the ability to think on my feet and fight—or run when I must.

You should learn. You should teach your family. Do it now. Do it quickly.

Nuclear War

A snapshot – September-October 2013

Given the Syrian civil war and President Obama's recent wishes to involve US military forces in action against the Syrian Government we thought it would be a good idea to bring back the idea of Nuclear War Survivability.

Many people have no idea of what direction or method nuclear war would take, whether it is a limited tactical exchange or a worldwide thermonuclear exchange of Intercontinental Ballistic Missiles (ICBMs).

It is a given that the American government believes in nuclear war survivability, but they take no actions to provide nuclear fallout shelters for the public. You see, it isn't the public they believe will survive. It's the military forces, but more important, the civilian government personnel, in particular the President and other government "leaders", Congress and the SES – Senior Executive Service personnel. The SES is none other than those strap-hanging, high level government workers who are promoted into positions of high bureaucratic authority. These people are usually GS-16 and above, they have some directorship position, all the way up to positions like Secretary of State and so forth.

The Russians not only take nuclear war survival seriously, they also prepare and train civilian populations to seek shelter and survive the attack. America simply assumes people will die.

The world has been on the verge of nuclear war several times since the advent of nuclear weapons.

Those almost-wars have always involved the United States and Russia. Some stories tell us we've "almost" stepped over the line roughly seven times in history.

In no particular order they are, the Suez Crisis (November 5, 1956), the SAC-NORAD communications failure (November 24, 1961), a U2 spy plane accidentally violates the USSR Air Space (October 26, 1962).

During the Cuban Missile Crisis time frame on October 26, 1962, an intruder caused a full scale alert by scaling a fence and triggering alarms – the alarms were triggered and instead of sounding alarms for the local security forces, caused F106s equipped with nuclear weapons to be scrambled. The flight was barely stopped by a car racing across the tarmac to stop them. The intruder turned out to be a bear. Not a Russian Bear, just a bear.

On January 21, 1968, fire broke out on a B-52 carrying a nuclear payload near Greenland, forcing the crew to bail out. The unmanned plane then crashed about seven miles from the early warning radar station in Greenland. The damage done could have been remarkable. The plane exploded, as did the explosives surrounding the radioactive core of the nuclear weapons (which require conventional explosives to detonate). Given the state of nuclear weapons technology at the time, this type of unintentional detonation of conventional first-stage explosives could have theoretically triggered the second-stage fission reaction, resulting in a nuclear explosion.

On November 9, 1979 several command centers received information that the Soviet Union had launched a full scale nuclear attack. Over the course of the next six minutes, planes were launched, nuclear missiles were initialized and prepared for immediate launch, and the President's National Emergency Airborne Command Post was launched. It took a few more moments to assess the situation, manually, and no satellites or other sensors were detecting launches, therefore the alarm was canceled. A software glitch caused the problem.

On June 3, 1980, at 2:25 in the morning electronic displays at NORAD, the SAC, and the Pentagon included prominent, highly visible numeric counters showing the number of enemy nuclear missiles detected began showing the numeral "2" instead of a "0" in a random fashion. Crews manning bombers carrying nuclear weapons were ordered to begin to warm up their engines. Minuteman missiles were initialized for launch. The airborne command posts were also launched. It was finally determined that this first event was a false alarm, however three days later it happened a second time, causing the entire emergency response procedure to start rolling once again. The problem was eventually traced back to a single faulty computer chip combined with faulty wiring.

Today we're in a position to be able to check and double check sensors, computers, satellites and even seismic sensors to tell us about launches. The chances of a "mistake" setting off a nuclear war are slim if not impossible. But we're looking at a face-off of the Russians and United States in the Mediterranean right now, today. The Russians have moved a large number of ships into place to protect Syria.

The United States has moved the Nimitz and a full carrier group into place, along with several destroyers. President Obama is calling for action over a chemical weapons attack, and apparently many Congressional leaders, including the GOP Speaker of the House is going along with this call. Today there is a debate going on, yet, Congress is not in session.

From my limited previous military life (almost thirty years), and from growing up during the Cold War I can see clearly the same signals and flags we saw when I was a kid and later in the military. Slow but sure build up, a flash point in the Middle East, Israel is "involved", the US is involved and the Russians are involved. Military movements on both sides are involved. Weapons of Mass Destruction are involved (albeit, not against our own troops or those of the Russians).

The Russians are protecting Syria. The USA is going after Syria. There is no way this can NOT be seen as a recipe for disaster.

Do I BELIEVE there will be a nuclear war? No, but there is a possibility it can happen. We have a scenario setting up that can lead rapidly and irreversibly to just such a condition. (And as of October 2014 nothing happened...)

Thus, this page is not actually to make YOU believe, nor to convince you it will happen. This page is here to provide a central location for links to information about survival of nuclear war. If you take a direct hit on your city or suburb or even close to a rural location where you might live, you will likely die. If, however you survive a nearby strike you will be subject to nuclear fallout, wild fires and fire storms. You will be subject to animals, wild and otherwise. You will be subject to the greatest predator on Earth; human beings.

Simply preparing a place in the woods to hide really isn't the best option, necessarily.

Simply staying put in a well-stocked dwelling (whether city or country) isn't always the best option.

Bugging Out or Bugging In isn't what it's all cracked up to be in various conditions either.

I'm not here to tell you the "best" because frankly, nothing I say will be of use if your own conditions don't match mine precisely. Anyone that tells you the only one way to survive something and that way is their way is lying to you.

No, ladies and gentlemen, the "**only way**" to survive is with a combination of knowledge, circumstances, training, practice and little of that "survivor luck" we talked about before. There is no formula, but there is hard work. There is no "right and wrong" to anything you do to prepare; there are the ways you do things that work and the ways you do things that will not work.

There is no one "best weapon" for survival, be it an AK47 type device, 9mm, .45, or AR15. Instead there is your own, precise knowledge of your weapons, your personal ability to persevere and your personal internal strength of will – and of course your personal physical abilities and limitations.

Your greatest asset is your mind, your education, your ability to learn both from books and others, but to learn from mistakes as well. Don't believe that sales person, or fancy Internet ad that tells you "Buy this! Survive! It's the only thing between you and doom!" You are responsible for you and you alone. Occasionally you might be responsible for family members who don't know how to fend for themselves, but again, you are there to teach them as well as help them stay alive.

You might find yourself in a position of being the only one of a group of adults in a bad situation of knowing what to do, when to do it and how to best accomplish something. That's when your own natural leadership skills will become important. There will always be those who know more, and those who know less. It's up to you to use what you know to remain safe and alive.

If a nuclear war starts, millions will die. City dwellers will certainly be the first doomed to die. Survivors will die from radiation sicknesses and starvation. In the days following nuclear strikes on the country, prevailing winds in North America will blow radioactive fallout eastward where the heavier particles will fall closer to the bomb sites. Lighter stuff will continue and fall further east or travel completely around the planet several times before finally falling to rest in the oceans, Europe, Russia and back in the good old, dead old USA. Animals will die. People will die. Fires will destroy large areas of forest, cities and farmlands.

Survivors will be those who are in the right place at the time of the attack and stay put, take action to protect themselves and those around them from the coming fallout. Gangs won't gather together for some weeks probably in such an attack simply because they are too busy trying to survive. Some weeks, perhaps two months after an attack the second wave of evil will come crawling out of the darkness, the hungry survivors from the cities. They will fight each other at first, then band together and move outward from no food to food. They will find your suburban home with fully stocked shelves, your wife and children, you and your guns. And they will take it all,

including your wife for their use, your children as slaves. They will take your food for themselves and your guns will be used to execute you and others who fight them.

Some weeks after the attacks, the ground invasion will begin. The Russians, Chinese, North Koreans and the Muslims will come, along with the Mexicans, the Guatemalans and all the other Central and South American scavengers. Canada won't be safe either, so don't think you will be happy there.

But you can survive. Your family can survive. You can fight back. You can live, for a time.... but if we are defeated in such an attack, our lives will be cut short and eventually the United States of America will be divvied up among the victors.

But do not worry, America will, if this President isn't in cahoots with the Russians and we're just watching smoke and mirrors, give as good as she gets. We will hit aggressors against us with all we've got, everything, including every missile and nuke available. Every man, woman and child in this country will fight invaders.

Assuming they survive the first bombs.

This article has links to manuals and information that will help you to survive.

This author's advice is simple? Read it. Heed it. Print it. Pass it along to others. Plan for the worst, but hope for the best—be prepared for anything.

Below are links to various forms of information. Many are online manuals, articles and forums. All contain information that you will find helpful. Please, throw out the stuff that "doesn't make sense" – but remember your brain is your deadliest weapon and greatest survival tool of all. Knives, guns, weapons, tools, backpacks and hoards for food are all nice to have; but without them if you don't have a clue, you're going to die anyway.

Collect the information and read it, copy it, print it out:

<http://www.ibiblio.org/rcip/nuclear.html#guides>

<http://theresistanceunited.com/2013/09/09/15-ways-to-limit-radiation-after-nuclear-armageddon/>

<http://www.transasianaxis.com/showthread.php?474-Global-Thermonuclear-War-Survival>

<http://www.transasianaxis.com/showthread.php?10337-Organizing-your-friends-and-families>

[http://www.transasianaxis.com/showthread.php?2173-E-M-P-\(EMP\)-e-m-p-emp-Electromagnetic-pulse](http://www.transasianaxis.com/showthread.php?2173-E-M-P-(EMP)-e-m-p-emp-Electromagnetic-pulse)

<http://www.transasianaxis.com/showthread.php?5474-Criminal-Gangs-in-TEOTWAWKI-Understanding-the-Potential-Threat>

<http://www.transasianaxis.com/showthread.php?10214-Chemical-Biological-Radiological-Nuclear-Training-%28CBRN%29>

<http://www.bt.cdc.gov/radiation/nuclearfaq.asp>

<http://www.ki4u.com/guide.htm>

<http://breakingdefense.com/2013/05/30/no-longer-unthinkable-should-us-ready-for-limited-nuclear-war/>

<http://www.wikihow.com/Survive-a-Nuclear-Attack>

http://www.cbsnews.com/8301-501465_162-20025919-501465.html

<http://gizmodo.com/5810157/how-the-us-was-supposed-survive-a-nuclear-holocaust-with-9-inches-of-concrete>

http://www.shtfplan.com/emergency-preparedness/survive-anything-chapter-1-nuclear-attack_04022010

<http://survival-training.wonderhowto.com/how-to/end-world-survival-guide-staying-alive-during-nuclear-holocaust-0140413/>

<http://www.tacticalintelligence.net/blog/how-to-make-a-field-expedient-water-filter.htm>

<http://theresistanceunited.com/2013/09/09/prepper-tips-for-bartering-post-collapse/>

(Note: It is now 2014 and a nuclear war hasn't broken out. But the Iranians are still working on that. So are the North Koreans. The Russians are testing the defenses of the US, Canada and the UK. China is testing the Australians, Philippines, Japanese, Vietnamese and others. A nuclear war hasn't become an obsolete idea whose time has come and gone. It's always right around the corner. The "Doomsday Clock" (<http://thebulletin.org/timeline>) is currently sitting at "Five Minutes to Midnight".)

Fallout Shelters and Nuclear Information for the Survivor

There are those who think that a world encompassing disaster will not only affect us all, but will probably kill us all. When one takes a look at statistics that say for instance, the safest form of travel is by airliner, the chance of being struck by a meteorite is astronomical, or that most accidents happen within 25 miles of home it becomes apparent that your chances for any incident are low just on a day to day basis. Every day on this world, though, we encounter objects and incidents that could lead directly to our own deaths. No matter how high the odds are of something happening, those “things” still happen.

A few years ago a friend of mine was killed in a motorcycle accident. He was traveling down the mountain and it is pretty certain that his own death was not foreseen by himself or others. The accident was, by all respects minor, and he wore his helmet. His death was a sad tragedy, for he left behind a wife and an unborn child. He was only 43. The day was clear, sun was shining, and the weather was great. The chances of his dying on that particular road, at that particular time and in the way he was killed tells one that it can happen to anyone, any time.

A few days before Christmas 2013, two Airmen on the way to Schriever, AFB in Colorado swerved to avoid a couch of all things. Five minutes before they hit an on-coming vehicle head on, I personally passed that couch and thought “Of all the stupid places to throw something on the side of the road,” and kept going. The couch was on a bridge and sitting on the white line on the right side of the road near the guard rail.

The two young men were killed on impact. I missed dying by five minutes perhaps. It might have been me who swerved across the line. I could have prevented that by stopping and moving the couch. But, I could also have been run over on that bridge, in the dark at 5:45 AM with folks speeding by at 65 MPH.

Our time on this world is limited, and our chances of survival in normal, everyday situations are tenuous at best. Any next moment could be “your time”.

So we ask, why worry about nuclear attack, rogue asteroids, socioeconomic collapse or major geological or meteorological disasters, or the random Alien Invasion? To make you think, that’s why! Regardless of this day and age where we see death and destruction on television daily, and it becomes a part of everyone’s lives in the “Big City”, life is sacred.

Life is all we have that exists between birth and death. There is little on this world that is worth dying for... saving another life or dying for your hard-core beliefs is probably worth the trip into the beyond. To some, that is the ultimate way to go. To me, personally, I’d like to hang around for a few centuries. Since we know that the normal, average male human life-span in the US is about 78 years now we can pretty much rule out hanging around that long. However, there isn’t a reason that this author can imagine not to TRY to hang around for as long as possible. It is within that spirit, through which this article on shelters comes to a life of its own.

There is strong evidence that multiple mass extinction events have occurred throughout time. This means that our chances of living through a cosmic collision with a random piece of rock are pretty low. So why not give yourself a fighting chance?

Why NOT spend some time considering the implications of “What Might Be”? The society of the West at the very least contains pockets of folks, probably just like yourself, who read and wonder every day what will happen if we have another world war, a global disaster occurs, or the society falls apart.

There are those among us who even say that the “Times, they are a-changin’” as we sit here reading this document. Many of us believe that there will be something that causes that tiny, little push that will drive society over the edge soon enough. Perhaps it is, as the media tends to call it, “Millennium Madness”. A few years ago an asteroid (Apophis) was predicted to come very close to Earth. Perhaps even to collide with us in 28 years – this has since been proven false, but the possibility exists, nonetheless. Every day we hear about the economy in Japan, Korea and Russia and we all know that the U.S. economy is closely tied to Japan.

When the “Big One” comes, we will at least have a tiny, remote chance of living through the first effects and perhaps to see the future of this world.

Why do I need a shelter?

Why do I need a shelter? What are fallout shelters and what good will they do? Aren't they all underground buildings, fully equipped with communications, forty years of rations and metal doors to keep out the riff-raff (or civilian population, if you're in the military). Actually, we will try to answer some of those questions. Let's start with why we might need a fallout shelter first, nuclear weapons.

Nuclear Weapons

Nuclear weapons come in a couple of types. One is a fission weapon. Another is a fusion weapons. Both types explode and use radioactive materials with which to fuel the detonation. Fission weapons generally use an isotope of Uranium and are lower yield weapons, probably in the kiloton range. (A kiloton is one ton of TNT equivalent.) A thermonuclear device uses isotopes of Plutonium with which to fuel the explosion. While these are somewhat “cleaner” bombs, they still use highly radioactive materials. Plutonium is classified as the most poisonous substance known to mankind. A tiny piece of it can kill several hundred humans due to its highly radioactive nature. Humans and other creatures can be killed by radiation by what is called radiation poisoning.

Essentially, biological functions are impaired and radiation causes burns, mutations in genetic structure, ionizing effects (the stripping of electrons from the outer valence shells of atoms) and other later-life problems like cancer. Whether your town is attacked by terrorists using low-yield weapons or a foreign government bent on destroying your way of life, nuclear weapons can and WILL ruin your weekend. During the detonation of a nuclear device, various isotopes of radioactive materials are created. It has been shown that as many as 300 or more types of radioactive isotopes are produced in a thermonuclear blast. All of them are deadly, some more than others.

A side note about “dirty bombs” which many believe to be nuclear weapons. They are not. Dirty bombs are conventional explosives which contain nuclear materials. The nuclear materials are used to contaminate an area.

Fallout and Radiation Effects

After a bomb is detonated, especially a low atmosphere or ground burst, portions of the earth beneath the fireball will be instantly vaporized and carried aloft by the blast and resultant windstorm. As the vapors cool, the matter returns to a solid state which includes dirt-matter, biological-matter and radioactive-matter, all combined into a fine, filtered dust which will settle downwind of the explosion(s). This material is called Fallout.

Fallout will probably be seen as a white or grayish dust material falling all over, sort of like snow. At least this is what we believe. Where ever this matter falls, deadly radiation will be found. Radiation is caused by an unstable element literally coming apart at the nuclear seams. Protons, neutrons, electrons and gamma radiation are given off by such elements. In the study of radiation, three types of radioactive components are given off, of which you should be aware. They are called Alpha, Beta and Gamma radiation products.

Alpha particles are low-penetrating types of radiation, and generally will not penetrate your skin and probably in all likelihood, won't penetrate your clothing. However ingesting this material either through respiration (normal breathing) or through food intake could be dangerous. From a survival standpoint, this type of radiation presents the least hazard to you.

Beta particles are high speed electrons leaving the atomic structure of the radioactive material. These energetic particles can penetrate materials at more than one hundred times the depth of Alpha particles. These particles are blocked by six or seven feet of air, but materials emitting beta particles getting on to your skin or even on your clothing will cause serious skin burns. The lesson here is to keep dusty material from falling on to your body, clothing or into the air in which you are breathing.

Gamma radiation turned Doctor David Banner into the Hulk in a popular children's comic book. In real life, gamma radiation will turn humans into a messy, dying mass of protoplasm if enough of it hits them at one time. Gamma radiation is almost always found in association with Alpha and Beta particles as a byproduct of emission. In other words, when a beta, or alpha particle are emitted from a radioactive material, the nucleus of the element compensates for the instability left behind and generates a radioactive wave, similar to an X-Ray or radio signal, only of much higher energy levels. Gamma radiation can pass through several inches of lead. Gamma radiation causes ionization of materials (especially biological material) by knocking electrons from the material.

Biological effects of global fallout will be felt for many years after the detonation of a nuclear device in the vicinity of the explosion, based on previous bomb test blasts. Such effects are based on the materials that were produced in the initial explosion and for how long they remain on the scene thereafter. For example, some of the isotopes produced by a nuclear blast are Strontium-90, Cesium-137, Iodine-131 and Carbon-14. These are only some of the various isotopes produced however. Each of these elements is similar to other elements which are ingested and used by biological creatures.

Also important in this respect is something called "Half-Life" of an isotope. Basically, this is how long it takes for one half of the available radioactive material to

dissipate. For instance, if a material has a 30 year half-life, then given a one pound block of this material, one half pound would remain after 30 years. In another 30 years only one-fourth will remain and so on.

Strontium-90 is a radioactive, calcium look-alike. It can enter the body through vegetable intake or through milk once it enters the body, Calcium or Strontium will be partially deposited as new bone material. Adults are much less susceptible to this than children. However, once deposited in an adult it takes much longer for it to be removed from the body. In sufficient quantities, one side effect is leukemia.

Cows have been found to have high levels of Strontium-90 in their bodies after bomb tests. Iodine-131 is just like iodine and enters the human body quite readily and into your thyroid. If you remember iodized salt being sold (and it still is) this was the reason salt contains iodine. The government determined that the iodine in your salt (something most Americans use daily in nearly everything) would push out or take precedence over radioactive iodine in the body. Personally, I'm not sure if that works....

Iodine-131 is a short lived (half-life is eight days) radioisotope. But, by the same token it is one of the highest potential sources for internal radiation since it concentrates rather quickly in the thyroid gland. Incidents of thyroid cancer will increase if large amounts of radio-iodine are accumulated into the body.

Cesium-137 is very similar to another element used by the body, potassium. Potassium is used throughout the body and essentially, so would cesium if absorbed into the biological system. It will remain in the body only a short time, even though it has a half-life of thirty years.

Carbon-14 has a half-life of 5570 years. It is produced naturally as well as during nuclear explosions. This material can irradiate the entire body, because it contacts the outside of the body, can be ingested from plants and perhaps other animals, and is breathed into the body.

As one can see, the effects of nuclear fallout are great, and the sources of radiation are many. It is important to be able to shield oneself from this potential radiation source, if one lives through nuclear war, terrorism or localized nuclear plant breakdowns. If any of these occur on a local basis, a shelter will become important. There are other reasons to have a shelter, besides a nuclear blast in your local region. Let's look at a couple.

Volcanic Activity

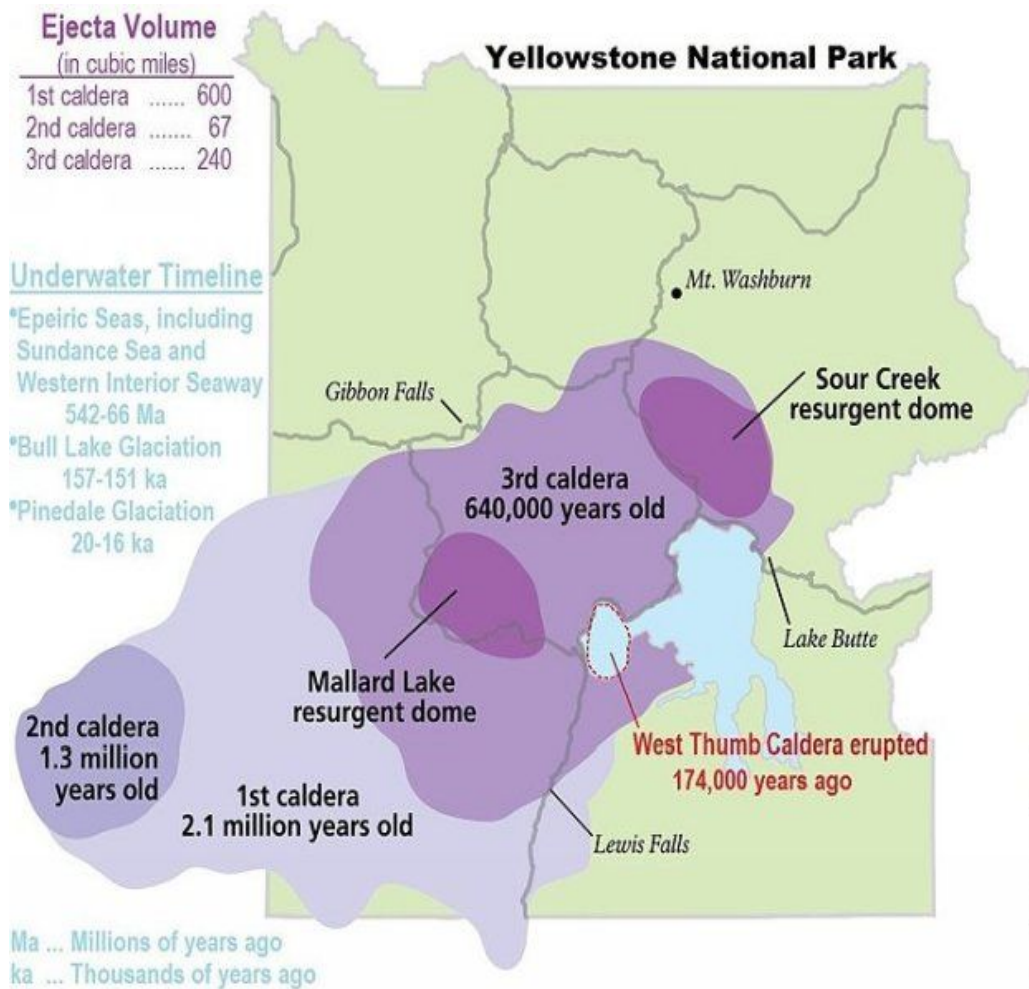
What if a volcano suddenly becomes active nearby? What then? Assuming it doesn't blow up outright, they pose other hazards to humans and the planet's population of plants and animals. Molten lava flows quickly in some cases, faster than a human can run. Also poisonous gases are vented, and blow with the wind.

A town that is affected by a volcano can quickly be killed by those gases. Water can be superheated and explode causing burns and death. A natural occurrence associated with volcanoes happens to be earthquakes, either preceding an eruption or directly after such an eruption.

An exploding mountain (such as Mount Saint Helen's) can give off billions of cubic meters of dirt, debris and dust particles. While this probably won't be radioactive, it will pose a health hazard, perhaps kill, thousands of people and animals in the downwind area. When Mt. St. Helen's exploded, I was stationed in Oklahoma at Tinker, Air Force Base. A day or so after the blast we were showered with a fine, white dust that got into everything.

Oklahoma City is hundreds and hundreds of miles to the Southeast of Mt. St. Helen's so even those thousands of miles distant may be affected.

Currently, Yellowstone has been growing rapidly. Geological evidence indicates that the Yellowstone caldera has exploded at least twenty-one in recent geological history, ranging from about 2.1 million years ago. Three major explosions have occurred at 2.1 million years, 1.3 million years, and 640,000 years ago. The last known eruption was 70,000 years ago. It threw out 2,500 *cubic kilometers* of ash.



ADAPTED WITH PERMISSION FROM *WINDOWS INTO THE EARTH* BY
ROBERT SMITH AND LEE J. SIEGEL, 2000.
Henry Heasler and Cheryl Jaworowski, US NPS, 2013.

Image from Wikipedia (2013)

Note the quantity of ejecta (material thrown from the volcano) the last of which being 240 cubic miles of rock, stone and ash. This material would have been blown high and wide, extending for thousands of miles to the north, south and west – based on prevailing winds. Cities to the East (had they existed at the time) would have literally been covered by ash and many would have died.

The point to this being that, while volcanic ash is not necessarily radioactive it is nonetheless dangerous to humans in high concentrations and to wild life, domestic animals and to plant life. In fact, enough of this stuff thrown into the air will blanket the whole of the landscape for hundreds, if not thousands of miles and in turn will darken the skies for months or years if the explosion is sufficiently large.

The United States, as we know it will cease to exist if this happens.

The last eruption of a super volcano was in Toba, Sumatra, 75,000 years ago. It had 10,000 times the explosive force of Mount St. Helens and changed life on Earth forever.

Thousands of cubic kilometers of ash ended up in the atmosphere - so much that it blocked out light from the sun all over the world. 2,500 miles away 14 inches of ash covered the ground.

Global temperatures plummeted by more than 20 degrees. The rain would have been so poisoned by the gasses that it would have turned black and strongly acidic. The Human

Race was pushed to the edge of extinction, the population forced down to just a couple of thousand. Three quarters of all plants in the northern hemisphere were killed.

In recent weeks (September 2013) Yellowstone had multiple quakes, approximately 130 over the space of a few hours. People who have been monitoring the area for years stated that it was highly "unusual". Researchers report the super-volcano underneath the state of Wyoming has been rising at a record rate since 2004. Its floor has gone up three inches per year for the last three years indicating the fastest rate since records began in 1923. The recent swarms of earthquakes began on September 10, 2013 and finished up on September 16, 2013.

It is also known that one end of Yellowstone Lake is 100 feet higher than it used to be and flooding the land at the other end and killing the trees. Trees in various parts of the park are dying because their roots are cooking from the heat under the ground. Bison have died from gas coming out of the holes in the ground.

Now, we're not trying to scare anyone. Whatever will be, will be, as the song goes, but the truth is that Yellowstone is a here-and-now-and-in-your-face disaster waiting for the right conditions to occur and it could happen in our lifetimes or it might wait until we're all dead and gone, and after the "nuclear war".

Incoming Asteroids, Social Break Down, World War IV

Although it seems like a Science Fiction novel, the likelihood of being struck by a meteorite of immense proportions is a higher statistical chance than dying in an airplane crash. Tell that to all those folks who died in plane crashes. Plane crashes occur with frequency that scares many out of flying. Why not a mass level extinction event once every few years? Well, it seems that they have occurred more often than we tend to believe. In fact, there are multiple craters all over the Earth that indicate large, sometimes as large as a couple of kilometers across, meteorites have crash landed in some of our back yards. (See "[Circumstances Beyond Our Control](#)") Beyond the atmosphere is that unlikely little rock, hurtling through space on a future collision course with Planet Earth. What if it hits? Destruction, death, you know, the usual. Those who are a good distance from the Earth-shattering collision will probably survive the strike.

Will they survive the following conditions? Human society is little more than a thinly veiled set of animal instincts. When pushed, the human animal is capable of many things, killing, surviving the un-survivable, unimaginable feats of strength and so on. What will happen when the government falls apart right after such an impact? What is going to happen when the government collectively realizes that no one is going to be going grocery shopping next week, and that even if they did, their money is useless? What will happen when the lights go out in a society that is heavily dependent upon electricity? What happens when nuclear war becomes an "already done" deal and we are in the midst of WW III? What good is a shelter then? Glad you asked.

Fallout Shelters

A fallout shelter is a place where you can drag your family when the going gets tough. It's a place where you can store food and survival supplies for if and when things do get out of hand. A survival shelter (let's actually call it what it is) is a place where you can rest while the rest of the world is falling apart, secure in the knowledge that you have done the best you could, with what you had at the time and given the circumstances.

It's a place that can protect you from that nuclear fallout, dark days following the asteroid hit, keep you safe for days against a biological attack (including things like viral infections and epidemics) and give you place to hole up when the society is crashing around you.

I believe we've answered, to most folks' satisfaction just what you do with a fallout shelter, why you might need one. We haven't answered some other questions though. For instance, aren't they giant holes in the ground, surrounded by military people protecting some government secret, and costing thousands, or millions of US dollars? Nope. A shelter that can be a haven in your house can cost as little as a couple of hundred bucks for some supplies to enhance what you have.

The rest of the article will address some ideas on enhancing your current situation, rather than packing up and moving out to the desert, or some other place without people. The first thing you will note is that we aren't going to directly discuss those of you living in apartments. This is because, in my opinion, an apartment is a very BAD place to be in either a nuclear or natural disaster. My advice is getting out when you can. Buy or rent a house. Besides, an apartment inside most cities is more expensive than renting a place away from the city in many areas of the United States. That is not to say that you can't do something to help your apartment become more survivable in certain situations, it's just that the ideal situation takes you out of a place you cannot easily control. Facts are facts; if you cannot afford to get out, then perhaps you should find a different job, look at moving to an area more conducive to your health or be prepared to deal with the legions of gangs that will plague you as soon as they discover there is little law left in the world.

There are a dozen different ways to create a shelter. Not the least of which is going out into your back yard and digging a very deep hole in the ground, putting in some kind of cool, not to mention expensive, building and then covering it over with three or four feet of dirt. Oh, and don't forget the special entrance-way, emergency exit, periscope and special weapons system (that you have to get a government license to use anyway), licensing fees, inspections and, oh, by the way, the zoning laws in your area. Your best all-around-bet, is to take an existing portion of your home, somewhere below ground if you have a below-ground area, and work on that.

You might find a wall that is in a corner of the house and reinforce the area with cinder-blocks and heavy timbers. You can actually do quite a nice job for such a room, building it INTO your home, including a heavier-than-normal door, or perhaps a steel door. You can build this area into a multifunction room as well. For example, imagine you have an area that is 12 X 12 feet. You might be able to build a set of storage shelves in the room that double as bunk beds. A special air filtering system can be built to both bring in filtered air, as well as exhaust stale, carbon-dioxide laden

air. A water storage tank can be stored in the room with a few days of water, with a system set up to bring in more water (preferably from an uncontaminated source). Obviously, each of us must work out minor details on our own, like water storage and so forth.

An area of your garage might be modified into some kind of a heavy-duty shelter as well. Similar methods as the basement shelter might be used to modify the garage. Some of us only have a one car garage and it isn't ever used for the car anyway, as in my case.

There are those with homes that do not have basements. You have a stand by shelter though. Beneath your home, in an emergency situation, might be a good place to go. Of course a little more work will bring out a nice storm shelter for you. Do you have a place to go in case of a tornado? You should!

A basement area can be modified easily with some masonry blocks (cinder-blocks), a couple of heavy-duty beams, and a floor jack or two. A floor jack is a weight dissipating device to help hold up the ceiling. A very simple modification, assuming you have an area of the basement that has walls on a corner available to you, would be to build two new walls to create room, using cinder-blocks. A shortened ceiling will go up, made from heavy plywood and reinforced with a floor jack (or two if you need them), braced with a 4X4 or 6X6 beam. Above the wood will go more masonry, preferably solid bricks. Bricks do two things. First, in case of real, nuclear fallout, cut down immensely the amount of radiation that will be received from the upper floors (in particular the roof). Secondly, in case the house above you begins to fall apart for whatever reason, the ceiling braces will prevent the complete collapse of the structure upon your head.

More Informational Links

Below you will find several links. Many of them are to a site for Nuclear, Biological, Chemical Warfare (NBC) training. The Med-NBC site contains much information. The majority of the information is contained in military field manuals. Some of them are online here already. Others can be located at the site below. The 1960s Civil Defense information is rather old (circa 1960) so, read it carefully, as it does contain some important information. However, note that some of the information contained in the manual may be out of date (such as prices for materials, and certain nuclear-related information).

Final Notes

This article is not intended to be the end word in shelters, nuclear related information or the answer to all your problems related to disasters. However, it is hoped that you have gained some knowledge you formerly did not have, and new links and data for your own personal use.

[US Army Manual FM 8-9](#) – Health Service Support in a Nuclear, Biological, and Chemical Environment

[Nuclear Biological and Chemical Medical \(Med-NBC\)](#) - contains extensive medical documentation, training material, audio-video clips, a powerful search engine

[Treatment of Chemical Agent Casualties](#) – FM 8-285

[Field Hygiene and Sanitation](#) – FM21-10

[Unit Field Sanitation Team](#) – FM 21-10-1 Waste disposal among other things

[Many Army manuals](#)

Circumstances Beyond Our Control

Night falls quietly on a tiny Midwestern town, the residents of which are quietly watching television, cooking their supper or relaxing from the day's hard work in the fields. In the large city nearby where several factories produce goods for the region, folks have settled into their evening/night shifts for work. The day shift has gone home for the night. Tomorrow is Saturday. For many it will be a day off of work. A few enterprising folks are preparing their small bass boats for a long day of fishing, starting very early tomorrow morning. A group of Boy Scouts left four hours ago for a trip into the mountains, a couple of hundred miles away, prepared for the weekend camping trip – they should be all set up at their camp site shortly.

As silently as the night falls, so too falls the twilight of mankind as a small asteroid makes it way to the atmosphere of the planet.

At midnight, Central Daylight Time, an asteroid the size of several city blocks hurtles into the atmosphere. Traveling at over twenty-five thousand miles an hour, the giant chunk of rock tears a hole into the atmosphere as it hits. The meteor slows quickly, but not before the massive friction causes the rock to glow, then to boil. The resultant ionized trail of gaseous material can be seen for hundreds of miles and thousands look up at the sudden, unexpected brilliant flash and trail. Two seconds after impacting the atmosphere, the meteor becomes a meteorite, striking the surface of the planet.

In a mere matter of seconds, tomorrow is suddenly upon us, disaster has struck and the hopes, fears and dreams of the entire planet are dashed into oblivion by a random, chance encounter with a rock a few miles across. The twilight of the human race has begun. The rock strikes in the United States, someplace in the south. Perhaps it is Texas, or Oklahoma. It might be along the Mexican border. No matter though, for the ensuing explosion is equivalent to over 5000 megatons... 5,000,000,000 or 5 billion tons of TNT. This is five hundred thousand times larger than the bomb that was dropped on Hiroshima in World War II. The ground for several miles vaporizes. The atmosphere has already been ripped through once by the massive shock wave of the passing asteroid now is ripped for a second time.

Aircraft within one thousand miles will be thrown from the sky by the second shock wave. For hundreds of miles in all directions the shock wave will radiate outward destroying everything in its path. Buildings, trains, airplanes, people, animals are pummeled to death by the overpressure of the explosion. Almost all man-made structures will be destroyed for hundreds of miles in all directions.

About 3-5 seconds after impact this shock-wave will push a large quantity of the atmosphere upward and away from the planet. Vast amounts of the atmosphere will be shoved violently into space, forever lost to the planet. Huge, billowing clouds will form near, above and in all directions around the impact site. Life – as they knew it – within 500 miles will cease to exist in less than ten seconds. Massive lightning storms will develop around the explosion within a few minutes.

Anyone caught above ground in this shock-wave will be killed by the shock wave, by the ensuing heat wave that follows it, or by flying debris if they are some distance away. None will be alive to see the lightning storms. Within a few seconds of impact, the secondary shock wave on the ground and within the planet will be

radiating outward through the entire world. It will be felt almost every place on the planet within moments. The exact numerical rating on the Richter scale will be unreadable in Boulder Colorado, because they haven't calibrated their equipment high enough. The readings will show Boulder's own quakes to be around 9 or 10. This will level homes and buildings throughout Colorado, Kansas, Nebraska, Utah, Oklahoma and Texas.

The tiny little Midwestern town, the city nearby and numerous cities, towns and rural areas become, quite suddenly devoid of life forms of any sort. The combination of the two shock-waves, then the heat wave and finally the earthquakes will pretty much kill any creatures in one or the other of the effects. The amount of debris and smoke thrown into the atmosphere will block out the sunlight the next day, and for the next many months. No bright sun shine will be seen for a long time. Day and night are difficult to distinguish around the globe. The far northern and southern latitudes are spared some of the effects of the smoke and dirt in the air, but everything is hazy and dim for months to come.

Plants that survived the hit, due to their distance from the impact point begin to die for lack of sunlight. Animals that depend on plants begin to perish a few days, perhaps as long as a few weeks later. Human beings the world over begin to be overwhelmed by the dust in the air. Many begin to die from respiratory dysfunction of all sorts. Food becomes scarce as the remaining grocery stores are emptied; trucks, trains and ships are stripped of food products. Factories are emptied. Electricity failed in many areas the first couple of days. As the weeks go by, more and more power plants drop off the grid.

Famine, thirst, starvation and death is everywhere. Packs of dogs roam the cities, attacking their once-masters, killing and eating humans as if they were simple prey in the forest of their wolf ancestors. Rats are everywhere. So are bugs, especially roaches around the urban areas. Wild animals that have so far survived the wilderness will begin making their way out of those areas in search of food themselves. Finding little to eat except a few pitiful humans, they will fight the dog packs for the choice pieces of meat. Some will fall to the dogs, some will win. Either way, the humans lose.

The Human Race is losing all the way around. This scenario is but one of the possibilities that might befall the frail ecosystem of this world, or the even frailer society of the human race. Although humans have taken over the planet as the dominate species of the world, we have technology, we think-therefore we are. In truth, we are nothing more than another species of mammals on this world, when it comes to Mother Nature. A disaster such as described above may have been the downfall of the dinosaurs that lived millions of years ago on this world. Their kind survived, according to science for many millennia. The human race has only been here a mere few thousands of years, a tiny moment in geological time.

On October 9, 1992, before ubiquitous cell phone videos and Youtube, a meteor flew over the United States, Kentucky, West Virginia, and New York. The event was recorded by 16 different individuals.

In the movies you see a meteor that flies across half the United States before finally coming to rest in the backside of a red Chevy Malibu located in New York City. The piece that landed was larger than a grapefruit, but certainly started out larger than

a basketball and perhaps even larger. From the movies you can see that it broke up into several pieces and had a very fiery entry into our atmosphere.

Rocks of a larger size, hundreds of yards or even miles across would perhaps break up, but would likely remain intact. The force of impact would be like a large nuclear explosion for those who are close enough to observe the effects.

It is most arrogant of human beings to sit and watch disaster movies at the theater and then wander off home to the security of their homes saying, "That is impossible because... <insert excuse here>". The base truth here is that we live on a tiny rock in a vast universe. Just imagining the size of the solar system is difficult. Trying to imagine the size of the galaxy is almost impossible for us. To try to see, in our minds the vast, enormous distance the universe covers becomes a mind-bending proposition, driving even the most ardent, logical scientist to God Himself in an attempt to describe that vastness. Looking at it from a purely scientific point of view, not taking into account the religious implications of thinking and souls and consciousness, one has to consider that this tiny rock in space is nothing more than a sand particle on the beach of the universe.

We are living on a grain of sand in a vast Universe and this tends to remind one that along the geological stretch of time, billions of years pass unnoticed in this galaxy of ours. Stars die, stars and planets are born. The distances to the next nearest stars would take humans hundreds of years at current technology and speeds to reach that star. Although it is only about four light years away, as light travels, we would die long before the trip there was over. An asteroid hitting this planet is not as far-fetched as some people want to make it sound. In fact, we are bombarded by particles daily, from space. Some are small as a grain of sand. Others are large as basketballs. There are craters all over the planet that are proof positive that giant rocks have struck this world in its distant past. The distant past as far as we humans are concerned but moments ago, geologically speaking. The following photos show actual craters on the face of the world, that have been created in times past by asteroids and huge meteorites just like in our scenario before.

Because our own lifespan is less than one hundred years, we do not understand the concept of time, except as a moment to moment concept. Our idea of "A few thousand years" is diluted by our own penchant to rewrite our history. Even in the past twenty years, we have gone from teaching about the Revolutionary War as a concept that happened in "recent history" to a concept of "that was a LONG time AGO" in our schools. As far as my own memories go, I remember the first Moon landing, Neil Armstrong and Buzz Aldrin. I remember watching Alan Sheppard go up into space for 15 minutes. I remember John Glen orbiting the world several times and splashing down in the ocean. I was a tiny little kid then. My own children don't remember the moon shots. They barely even noticed the Space Shuttle and we're not even launching those now. Our space program is for all intents and purposes dead and turned over to the Russians. Times are a-changing.

Science and technology are routine. Movies show terrible disasters and people live through them. It is very difficult in our day of technological advancement to comprehend the fact that we cannot stop an errant piece of space debris from hitting us. We see nuclear weapons, and massive amounts of the Earth's surface changed by ourselves and believe that it is nothing to move a rock in space.

What we fail to realize is the kinetic energy involved as well as the laws of physics. We've heard it said, and in fact it has been shown in recent movies that it would be possible to stop an incoming comet. But in essence this would be akin to you standing two hundred yards from someone with a gun. He fires a high-powered rifle at you. You then get to reach down, pick up your own high powered rifle and fire back. Only thing is, you don't get to shoot the shooter, you must knock his bullet out of the air.

Not so easy a feat, huh? Our technology has us over-confident that our self-same technology will always pull us out of a fix we're in. People that you talk to will say, "Oh, the government will take care of us", or "Heck, we'll just nuke that rock right out of the sky!" While it isn't impossible for us to move, slow down or stop a big chunk of rock from falling on our heads, it is almost as unlikely that in the time we would have from its discovery that we could even mount such an attack. Perhaps worse, it is highly unlikely that if we see something now, and have decades to do something that we'd bother. Kicking the can down the road is also a human tendency.

Science is good. Calculations, nuclear weapons and asteroid trajectories can be handled in this day and age. But these things rely on a couple of important factors. The first factor is that we see the offending piece of rock before it hits us, and that means in plenty of time to actually do something to change its course.

The second factor is that we have to be able to do something to change its course, have a space craft, or missiles sitting in various parts of world ready to go. If the rock is big enough and time is short, nothing on this world we can do will move an incoming asteroid enough off course to make it miss us.

Currently, there are projects working, privately funded that are attempting to locate Near Earth Objects. But the government does not have a highly funded project at this point in time and as recently as March of 2013 (just after the meteor over flew Russia, breaking windows and being videotaped by many people) NASA downplayed the event and asked Congress not to allocate more money.

Congress has listened to authorities on Near Earth Objects, and the hazards they pose. There are several internet sites that will give you some more information regarding objects in space that pass close enough, and are large enough to be serious hazards to the planet, the ecosystem and mankind itself.

One main point throughout this article comes to the forefront. If this ever happens, there is little hope for escape for those in the target zone. However, depending on the size of the rock, the location of impact, time of day of the hit and the warning we get some people will probably survive. It is toward that survival that we all should think. Regardless of the time-space continuum, Star Trek-like technological achievements or man-made answers to the cosmos we should be worried about such things happening, and most of all that worry should be put into action. Therefore you should be preparing, teaching and training for the day when circumstances are beyond our control.

Notes about “Circumstances”

The above article was published on a web site, now very long gone from the Internet, the Anomalies Network. The site is still there, but the forums and articles are gone. It was published sometime back in the beginning of 1990 or 1991 and as you can see it is just as relevant today as it was twenty years ago. It was recently edited to add a few things, such as the Russian meteorite at Murmansk in 2014. Other than that, most of the article is original.

As of this writing, Scott Carpenter, one of the last of the Original Seven passed away. The last of those astronauts is John Glenn, Senator from Ohio. Over the years several of these astronauts attempted to bring to bear on the US Government their own form of Public Relations to get the government to hunt for Near Earth Objects. There have been some successes and some failures. It is our belief that with the death of the space program, most of the original astronauts, that we will never again be as powerful a voice for the protection of this planet from space debris.

What about ME?

If you made it this far, and I hope you have, you're asking yourself the question above. What about me! What about my Family!?

As we've tried to point out through this paper each of us has our own lives, our own circumstances, our own experiences. I can't give you all the answers on a piece of paper you can check off, there's no computer program that says "If this, then do that". There is one computer and one only you will be able to count on in any accident that places you in a survival situation or at The End of the World as We Know It. That computer is your brain.

It won't be affected by EMP. But can be affected by fatigue, cold and heat, rain, hypothermia, lack of food, water, and air.

Let's make some assumptions then, to give you one last example (No offense to the ladies, but I can only speak to a man's point of view, not a woman's). You're a married man. Your family is an average American, middle class, nuclear family. You own and read the Bible. Or maybe you don't. You go to church on Sunday, work Monday through Friday, and commute from 5 to 25 miles a day. Both you and the wife work, kids go to school and they are younger teens. You're probably 30-something(ish). You go about your business day to day and don't like government interference, don't like having to walk through "da hood" to go to the movie theater or a restaurant, and possibly can't even afford to go out more than once or twice a month.

You are buying your house and you and the bank own it – the bank more than you, but you make your payments. You live in a newer area of town, outside of a city – a suburb of a smaller city. Your kids walk to school. You pay your bills. You and your wife both drive newer vehicles. You pay little attention to politics unless something directly affects you. You own one rifle because you like to hunt sometimes. You don't go to a shooting range, because you just don't have time.

You are Mr. Joe Average, White Middle Class working guy.

(And for the record, this paper is NOT aimed at you alone – but anyone, no matter their color, religion, or living conditions!)

What does Mr. Joe Average do to worry about survival? Nothing at all because frankly he has an iPad, iPhone, gets 3000 channels on his satellite dish, pays his bills, doesn't care very much about what the government is doing right now because it isn't his problem. He doesn't teach his kids how to make a fire, fish or hunt because it's not a primary interest. He has bills "out the ass" because he has a mortgage on a rather large house in the suburbs, two or three kids to raise, and make sure they have their iPhones, iPads and computer systems at home. His wife has her job, has her friends, and interests which don't much overlap Mr. Average's particular interests (which might be washing his SUV on Saturday or reading computer magazines, whatever).

Why did we choose this guy? Wikipedia tells us the answer.
http://en.wikipedia.org/wiki/Average_Joe

"Average Joes" are common fodder for characters in [television](#) or [movies](#), [comics](#), [novels](#) or [radio dramas](#). On television, examples of "average Joes" include

[Doug Heffernan](#) ([King of Queens](#)), [Archie Bunker](#) ([All in the Family](#)) and [Homer Simpson](#) ([The Simpsons](#)). In the film [Dodgeball: A True Underdog Story](#), the [protagonist](#), Peter, owns a gym for those who don't want an intensive workout, and the patrons of the gym are all somewhat overweight. The gym is named Average Joe's Gymnasium.

If you examine that page you will note that the up and coming group in America is unmarried families with children. But who cares? We're talking about you. We don't know if you truly fit in the above group of Average Joes or not. It's not important. But for the example we can look at above you will see "Joe" doesn't much pay attention to anything other than getting to work, getting home, maybe working out in the gym and getting to the weekend to do whatever it is he does on weekends.

So the whole point here is simple. What YOU do is up to you. How you live your life is your problem, no one else cares. The government doesn't, though they like you to think or believe they do. Why else do they create so much regulation? To HELP you... right.

You are you, your family is yours, your life is yours and your preparations or lack thereof are on your own head. Not the author's, not your neighbors, not your mother or father, and especially not the government or taxpayers.

Your final moments on this planet will either be to die peacefully in a bed, or perhaps wondering where you took a wrong turn in life, trying to decide if you should have crossed the street to avoid the punks, or not been in the city when it was nuked. Random events have a way of changing your plans for the day, or for the rest of your life and ***you are the only one who can make sure you're not part of those random events.***

Final Thoughts:

We have covered a lot of ground. We have provided links and end notes for the paper as necessary and possible.

All of the links should answer other questions you might have. We have taken extensive advantage of Wikipedia which under normal circumstances this author is loath to do. Wikipedia is notoriously slanted politically and in many cases slanted towards the “Left”. However, when it comes to technical details it tends to shine, and people get corrections accomplished. Even if Wikipedia is somehow inaccurate it will tend to provide footnotes/endnotes and links within articles which will assist a reader in obtaining an even wider range of data, something which is key to learning and understanding. Never take one source as gospel. Read it all and then figure out on your own where the lies, inaccuracies, truth and facts are found. That INCLUDES but isn’t limited to this book. You can check 90% of what is written here. The opinions of the author of course are his but you might agree with many of them, but our advice remains constant, even if you agree; CHECK. Use objectivity though, do not assume something is right or wrong because you agree or disagree.

In summary we have covered some legal information and provided you links to find out more. We have emphasized that using any radio system without licensing might make you a wanted person, and fines for breaking Federal regulations in the radio services can be quite hefty, more than the average person would really have in their pocket as small change. So one last time we ask that you ensure before you transmit you are authorized to do so legally. If you have no intention of obtaining a Ham or GMRS license for instance, nothing is to stop you from getting the equipment and using it in any manner you wish; until you get caught. With the Amateur bands, you will certainly be caught. Hams are notoriously protective of their spectrum and even this author has helped locate interlopers (we call them Bootleggers). The FCC will have a hearing and fine you for each intrusion causing interference of a service and it can be as much as \$25,000 per incident. Each time you key that microphone, you might be adding to the Federal Government’s piggy bank. So stay legal.

Even if you find yourself headed for a true, honest-to-goodness “Aftermath Scenario” complete with nuclear bombs and aliens, asteroids and exploding volcanoes don’t do anything that can be construed by the powers-that-be as illegal until said powers haven’t any more power to pursue you. Once the aliens have overrun the District of Columbia, and the nukes have hit the ground vaporizing some cities, only then are you going to be relieved of the weight of massive regulation. And even then, our new Alien Overlords might see things differently from their many faceted, watchful insect eyes....

The world is a very volatile place and wars are being fought in the Middle East, Africa and there are small conflicts in South America that barely make the news, if at all (UK and Argentina over the Falklands for example). The governments of South America, specifically Venezuela, Cuba and some of the Island Nations of the Caribbean have banded together to form a more-or-less Anti-American-anti-Capitalist

type of coalition. The Russians and Chinese together with Iran, North Korea, Syria and a few others have banded together to form, you guessed it, a kind of Anti-American Coalition. The US still has NATO, but even those countries are pulling back from the US. Russia has made many forays into probing NATO's defenses lately (2014). One day, somewhere down the road if this continues it will be everyone against the USA. That's when you're going to be surprised with that "Aftermath Scenario".

Speaking of the Aftermath Scenario, while we believe that most of this will never come to pass, there is also the distinct possibility that anything can happen. The very idea that the electricity will always keep flowing, the US will always be a Superpower, Yellowstone can't possibly explode and a rogue asteroid can't possibly hit the planet is very, very bad thinking. While most folks reading this paper will agree with the author on this, there will be those who take exception, and perhaps vehement exception that things can and will change. They will be in the first die off, and apologies to those who think this way, but we'd point out that the Romans didn't think Rome would fall. The Soviet Union didn't believe the USSR would fall. No one knows who the Easter Islanders were, or what happened to them. Few people have heard of the Harappan Civilization in the Indus Valley, who vanished around 1700 BC. Supposedly, the Mayans thought they'd be around until at least December 21, 2012, but before the Spanish Conquistadors arrived, they left. The Minoans are gone as are the Chachapoya of the Andes, destroyed by the Incas just before the Incas were conquered by the Spanish. The Clovis people, first "Americans" are gone, perhaps 13,000 years ago. All of these were large human societies, civilizations in some cases like the Roman Empire. All of them are extinct. Perhaps their people still live among us with nary a clue as to who they once were.

Look where all those civilizations and societies went. They went precisely nowhere; they are gone, defunct and deceased now. But, the Soviets will live again if Vladimir Putin has his way. Ancient Rome is gone forever, leaving only relics of the past. So are the Mayans, Minoans, the Harappan and the Indians who fought the Spaniards, all are gone. Some are living among us now, absorbed into other civilizations, or into the race that conquered them in the first place. Perhaps they are extinct. Nothing stays the same, and no civilization remains on Earth forever.

Two thousand years from now Americans, Russians, Mexicans and Chinese will be living "among each other" in another, third or fourth "rise of modern civilization" after World War III, IV or that alien invasion. Perhaps they won't know much about the US, Russia or China, but simply have heard of the old civilizations. Scholars will argue and debate the end of each, how it happened, what caused the demise. Unless there are records that haven't been vaporized by nuclear weapons, or the burning ashes of Yellowstone, there will never be a definitive answer for the destruction of the "Modern Era" and the Western World. Each of the previously mentioned groups like the Mayans, et al, experienced their own "Aftermath Scenario", and all, with the noted exception of the Soviet Union had little or no modern technology. The Soviet Union fell from internal problems, as well as external pressure of the United States, and the failure of Communism – which ought to be a lesson to other countries following that

path, but so far China has ignored the lesson as has North Korea. Muslim dominated countries are forever at war with one-another, and others outside. Their religious beliefs and Sharia Laws are diametrically opposed to Christianity and Judaism, thus all of these groups are at each other's throats constantly.

Marxist Socialism is failing. Socialism in general is failing as, as we speak in places like Greece, Spain and even the United Kingdom. All of these countries have come to learn the hard lesson that eventually when you take too much from those supporting the government with taxes, the government, and those who are being supported by that the government cannot stand for long. A top-heavy government will fall. The United States hasn't learned the lesson and has become very top heavy, power hungry and oppressive. If the system continues as it is, more and more will stop giving to the government, and it will collapse. Our own "Aftermath" could be a simple economic collapse followed by a world-wide collapse, exacerbated by some climatological nightmare like Yellowstone or an asteroid strike causing the final epitaph of the USA to be written in the ashes.

Remember that while surviving the Aftermath it might not be such a keen idea to transmit on a radio either because someone that doesn't like you might be listening and looking for you or will find you based on your signals. Whether that is an alien with three legs and seven eyes or a multi-armed evil entity like a foreign (or local) government bent on your obliteration is up to you to determine. We won't be there to help you then, and you're on your own.

Aftermath communications as well as survival is vastly more complex than what we have outlined here, but we've given you a primer to help you along the road to being Aftermath Communications Savvy.

In comparison each type of radio or service has some advantages and disadvantages and it's up to you to weigh each against the other, and against your *personal requirements*. In simplistic terms your "communications requirements" will only help keep you alive as long as you use whatever sort of equipment you can obtain to collect and use information around you. Sometimes you will use a radio system to give others information which can help them. But it might help an enemy looking to find you or your friends. In either case, the Aftermath hasn't yet occurred or we would not be providing any advice.

There is an old saying that goes; "It's better to be thought a fool and not speak than to open your mouth and remove all doubt." How this applies to us and Aftermath communications should be obvious by now. While the ability to transmit a signal might save a life today in a normal world, in a world torn apart and turned upside down, the ability to listen to your possible adversary is certainly a greater asset than simply calling them up and giving them your location, troop strength and ability to kick their asses. In the real world of "Aftermath" you won't be talking to many folks and if you are, it's going to be tactically advantageous if you are all using some secret method of communications, such as code words or encryption that won't easily give away your plans to the enemy.

So the final advice is simple. Study what you can use. Examine your own, personal needs and then before it gets rough, get your stuff together; learn to shoot, fish, hunt, get the equipment you need, get a ham license while we still have a society to live in and use your equipment legally, safely and to learn. Once you have learned you are ready for anything that a Mad Max existence can throw at you. In theory... anyway!

As said several times through this manual, “Times they are a-changin’” and we have lost as much in the past five years as we have gained in the two hundred plus years of our country’s existence. Essentially this entire manual is about the “What if” that might happen and you, the reader taking time to learn some skills that most people do not have. That includes all those things listed, but educate yourself on things like history, science and ***teach it to your children***.

The entire planet could be someday destroyed by a rogue asteroid, and according to scientists the Earth certainly will cease to exist in a few billion years when the Sun suddenly expands into a Red Giant. Long before that happens we can hope that our ancestors have grown smart enough to travel to the stars, to propagate our species throughout the galaxy.

But, before that event some nine billion years from now we could be hit by that one asteroid we don’t know about, and aren’t yet tracking. Such an asteroid could come from beyond the blackness of space or from our own asteroid belt out beyond Mars, a rogue rock hit by another rock and knocked out of its orbit. This could happen day after tomorrow, or it could happen tonight, in fifty years or never at all. The possibility however does exist and we could be doomed by a rock that destroys a city or a continent.

If it isn’t a planet buster, we could suffer across the planet from ash, firestorms and broken tectonic plates allowing magma to bubble up and destroy even more. Millions could suffocate, or die from ash—not unlike those at Pompeii when Vesuvius blew up.

This author’s personal belief is that this will indeed be the way the human race ends it’s time on this world. It won’t be by nuclear war; it won’t be a complete wipe out by disease, or volcanic action. The universe is a random, dangerous, deadly place and the fact there are uncharted rocks floating through space at great speeds means we will of course never know when or from what direction it will come.

It is strongly believed in the scientific community that dinosaurs were wiped out by just such a rock. In fact there have been multiple large extinction events through the history of the planet. No one knows precisely why they occurred but certainly asteroids might be one way. Another could be a wild Gamma ray burst from a neutron star. Yet another might be we wipe ourselves out with war, disease or simply die off because it’s just “our time to go”.

Even so, the human race, like other creatures on this planet will probably survive by hook or crook no matter what happens, unless we are simply destroyed by the whole planet losing its atmosphere or we’re irradiated by a gamma ray burst. Do yourselves a favor and move that ability to survive to the forefront of your knowledge and skills. You never know the one thing you teach your children to survive might be passed on for generations untold and save a life in another, future time.

[1]

- http://en.wikipedia.org/wiki/Cold_War
Wikipedia entry for Cold War
- [2] http://en.wikipedia.org/wiki/Electromagnetic_pulse
Wikipedia, Electromagnetic Pulse entry
- [3] http://en.wikipedia.org/wiki/The_Stand
Captain Trips Virus (The Stand, Stephen King)
- [4] <http://nymag.com/news/articles/wtc/1year/numbers.htm>
New York Magazine
- [5] http://en.wikipedia.org/wiki/United_Airlines_Flight_93
Wikipedia, Flight 93 entry
- [6] <http://neo.jpl.nasa.gov/>
NASA web site explaining Near Earth Asteroids
- [7] http://science.nasa.gov/science-news/science-at-nasa/2012/16may_pha/
NASA site about Potentially Hazardous Asteroids
- [8] http://www.biology-online.org/dictionary/Mass_Extinction
Mass Extinction definition, Biology Online
- [9] <http://www2.jpl.nasa.gov/sl9/back3.html>
NASA web site with Cretaceous-Tertiary Mass Extinction event (K-T event)
- [10] <http://blogs.discovermagazine.com/80beats/2008/12/16/forget-the-asteroid-could-supervolcanoes-have-killed-the-dinosaurs/>
Discover Magazine
- [11] http://en.wikipedia.org/wiki/Mount_St._Helens
Mount St. Helens Wikipedia entry
- [12] <http://news.discovery.com/space/asteroid-impact-hazard-2040-120228.html>
"Massive Asteroid to hit Earth in 2040?"
- [13] <http://en.wikipedia.org/wiki/Balrog>
Wikipedia Balrog entry
- [14] http://www.mnh.si.edu/earth/text/4_2_5_2.html
The Dynamic Earth, Yellowstone
- [15] <http://en.wikipedia.org/wiki/Gandalf>
Who is Gandalf?
- [16] http://volcanoes.usgs.gov/volcanoes/yellowstone/yellowstone_sub_page_54.html
USGS: Yellowstone, Volcanoes Hazard
- [17] <http://www.universetoday.com/38125/how-long-have-humans-been-on-earth/>
Universe Today: How long have humans been on Earth?
- [18] <http://www.earthmountainview.com/yellowstone/yellowstone.htm>
- [19] <http://westvirginiainews.blogspot.com/2009/09/wv-residents-may-want-to-reconsider.html>
West Virginia News: WV Residents May Want To Reconsider Next Trip To Yellowstone Park
- [20] <http://www.dailymail.co.uk/sciencetech/article-1268712/Stephen-Hawking-Aliens-living-massive-ships-invade-Earth.html>
Daily Mail: Stephen Hawking: Earth could be at risk of an invasion by aliens living in 'massive ships'
- [21] <http://space.about.com/b/2010/04/27/hawking-warns-of-possible-alien-invasion.htm>
About.Com: Hawking Warns of Possible Alien Invasion
- [22] <http://curiosity.discovery.com/question/exoplanets-discovered>
Discovery: How many Exoplanets have been discovered?
- [23] <http://www.seti.org/drake>
Frank Drake
- [24] <http://www.seti.org/drakeequation>
The Drake Equation
- [25] <http://www.pbs.org/lifebeyondearth/listening/drake.html>
PBS: Drake Equation Calculator online

- [26] http://en.wikipedia.org/wiki/Fermi_paradox
Wikipedia entry for Fermi Paradox
- [27] <http://en.wikipedia.org/wiki/Nanorobotics>
Wikipedia entry for Nanorobotics
- [28] http://en.wikipedia.org/wiki/Chaos_theory
Wikipedia entry for Chaos Theory
- [29] http://en.wikipedia.org/wiki/Wall_Street_Crash_of_1929
Wikipedia entry for the 1929 Stock Market Crash
- [30] <http://www.history.com/this-day-in-history/stock-market-crashes>
Stock Market Crashes
- [31] http://en.wikipedia.org/wiki/Great_Depression
Wikipedia entry for the Great Depression
- [32] <http://www.epa.gov/>
The Environmental Protection Agency
- [33] http://en.wikipedia.org/wiki/United_States_Environmental_Protection_Agency
Wikipedia Entry for the EPA
- [34] http://en.wikipedia.org/wiki/Cold_warrior
Wikipedia entry for Cold Warrior
- [35] <http://www.outsidethebeltway.com/biden-tea-party-terrorists/>
Joe Biden calling the Tea Party "Terrorists"
- [36] <http://www.themoscowtimes.com/business/article/more-russian-ships-on-way-to-syria/460709.html>
Moscow Times
- [37] **What is the Trans-Asian Axis?**
The Trans-Asian Axis is a global anti-American/anti-Western alliance headed by Russia and China with its ultimate goal being the downfall of America and Western Civilization. If you want to learn more, visit <http://www.transasianaxis.com>
- [38] http://en.wikipedia.org/wiki/Bug-out_bag
"72 hour" or Bug out bag
- [39] http://en.wikipedia.org/wiki/Communication_during_the_September_11_attacks
Communication during the September 11 attacks
- [40] http://en.wikipedia.org/wiki/Busy_signal
Busy Signal. What is a fast busy?
- [41] http://en.wikipedia.org/wiki/Mad_Max
Mad Max
- [42] <http://www.todaysengineer.org/2007/Sep/HEMP.asp>
HEMP, High Altitude Electromagnetic Pulse weapon
- [43] http://en.wikipedia.org/wiki/Electromagnetic_pulse
EMP
- [44] <http://en.wikipedia.org/wiki/CMOS>
What is CMOS?
- [45] http://en.wikipedia.org/wiki/Solar_storm_of_1859
Carrington Event, Solar Storm of 1859. This event destroyed telegraphs, batteries, caused fires. The event was a major solar storm without the high technology of the 21st century. An EMP is significantly worse.
- [46] <http://www.allvoices.com/contributed-news/12415434-iran-russia-china-syria-to-plan-war-games-in-mideast>
All Voices: Iran, Russia, China and Syria to plan war games in Mideast
- [47] http://en.wikipedia.org/wiki/The_Day_After
Wikipedia entry for "The Day After" movie.
- [48] <http://weather.gov/>
National Weather Service website
- [49] <http://skywarn.org/>
Skywarn website
- [50] <http://weather.noaa.gov/radar/radinfo/radinfo.html#radar>
How Doppler Radar works

- [51] <http://transition.fcc.gov/pshs/services/amateur.html>
Amateur Radio Service
- [52] <http://www.winlink.org/>
Winlink 2000
- [53] http://en.wikipedia.org/wiki/Continuous_wave
CW or Continuous Wave
- [54] http://en.wikipedia.org/wiki/Radio_frequency
Radio Frequency
- [55] <http://en.wikipedia.org/wiki/Transceiver>
Transceiver
- [56] <http://www.fema.gov/>
FEMA's website
- [57] http://en.wikipedia.org/wiki/Federal_Emergency_Management_Agency
Wikipedia entry for FEMA
- [58] <http://www.ambientweather.com/emra.html>
Hand crank radio web site. Note: The author does not endorse this site or any other site selling radios or survival gear!
- [59] <http://www.radioshack.com/home/index.jsp>
Radio Shack web site
- [60] <http://www.freeplayenergy.com/>
Freeplay, formerly Baygen
- [61] http://en.wikipedia.org/wiki/Beat_frequency_oscillator
Beat Frequency Oscillator
- [62] <http://en.wikipedia.org/wiki/Heterodyne>
Signal Mixing or Heterodyne
- [63] http://en.wikipedia.org/wiki/QRP_operation
What is QRP?
- [64] <http://en.wikipedia.org/wiki/Hertz>
What is hertz and gigahertz?
- [65] http://en.wikipedia.org/wiki/Faraday_cage
Wikipedia entry for Faraday Cage, how they work
- [66] http://en.wikipedia.org/wiki/AM_broadcasting
Wikipedia entry for AM Broadcasting
- [67] http://en.wikipedia.org/wiki/Amplitude_modulation
What is Amplitude Modulation?
- [68] http://en.wikipedia.org/wiki/Frequency_modulation
What is Frequency Modulation?
- [69] http://en.wikipedia.org/wiki/Emergency_Broadcast_System
Emergency Broadcast System
- [70] http://en.wikipedia.org/wiki/Emergency_Alert_System
Emergency Alert System
- [71] <http://www.duhaime.org/LegalDictionary/N/NationalEmergency.aspx>
Definition of National Emergency
- [72] http://en.wikipedia.org/wiki/Shortwave_radio
Shortwave radio definition
- [73] http://en.wikipedia.org/wiki/Citizens%27_band_radio
What's a "CBER"?
- [74] <http://en.wikipedia.org/wiki/Ionosphere>
What is the ionosphere?
- [75] <http://en.wikipedia.org/wiki/DXing>
What is DXing?
- [76] http://en.wikipedia.org/wiki/Single-sideband_modulation
What is single side band or SSB?
- [77] <http://www.hamradio.com/>

HRO or Ham Radio Outlet

[78] http://en.wikipedia.org/wiki/Vacuum_tube

What are vacuum tubes?

[79] http://en.wikipedia.org/wiki/To_hell_in_a_handbasket

Hell in a Handbasket

[80] http://en.wikipedia.org/wiki/Power_inverter

Power Inverters

[81] <http://www.policescanners.net/general-information/scanner-legality/>

Scanner legality

[82] <http://www.afn.org/~afn09444/scanlaws/>

Other laws regarding scanners

[83] http://en.wikipedia.org/wiki/Krav_Maga

What's Krav Maga?

[84] http://en.wikipedia.org/wiki/Situation_awareness

What is situational awareness?

[85] http://en.wikipedia.org/wiki/Societal_collapse

Societal Collapse

[86] http://en.wikipedia.org/wiki/Dissolution_of_the_Soviet_Union

Soviet Union Collapse

[87] http://en.wikipedia.org/wiki/Survival,_Evasion,_Resistance_and_Escape

Escape and Evasion

[88] <http://en.wikipedia.org/wiki/Orienteering>

Orienteering

[89] http://en.wikipedia.org/wiki/Transmitter_hunting

Transmitter or Fox Hunting

[90] <http://en.wikipedia.org/wiki/Survivalism>

Survival and "TEOTWAWKI"

[91] http://en.wikipedia.org/wiki/Citizens_Band_radio

Citizens Band Radio

[92] http://en.wikipedia.org/wiki/C._W._McCall

C.W. McCall and Convoy

[93] <http://www.arrl.org/part-97-amateur-radio>

FCC: Amateur Radio Regulations

[94] http://en.wikipedia.org/wiki/Marine_VHF_radio

Marine VHF Radio

[95] http://en.wikipedia.org/wiki/Family_Radio_Service

Family Radio Service

[96] http://en.wikipedia.org/wiki/General_Mobile_Radio_Service

General Mobile Radio Service